Volume XVIII, No. 2
and
Volume XIX, No. 1

January
and
July 1947

OFFICE OF THE REGIS...
24 JAN 1949
MADRAS

JOURNAL

OF THE

MADRAS UNIVERSITY

Section A. Humanities

DR. R. BALAKRISHNA, M.A., PH.D.

DR. G. KURIYAN, B.A., B.SC. PH.D.
DR. T. M. P. MAHADEVAN, M.A., PH.D.
MR. V. R. RAMACHANDRA DIKSHITAR, M.A.
MR. P. SAMBAMURTI, B.A., B.L.
MRS. ELLEN SHARMA, M.A., M.ED.
MR. R. BHASKARAN, M.A.

1782

PUBLISHED BY THE UNIVERSITY
MADRAS
1948

JL
T4 ம 2111
N47 .18.2, 19.1
93184

TABLE OF CONTENTS

PAGE

1. GEOGRAPHY—THE FOUNDATIONS OF HISTORY
   By George Kuriyan 45

2. MUSIC AND MATHEMATICS
   By P. Sambamoorthy 62

3. NAYAR
   By L. A. Krishna Iyer 73

4. TRENDS IN THE FOREIGN TRADE OF INDIA
   By R. Balakrishna 82

5. THE INDIAN COAL INDUSTRY—SOME PROBLEMS
   By V. Kalyanasundaram... 93

6. FUTURE OF FEDERAL FINANCE IN INDIA
   By R. N. Poduval 107

7. BOOK REVIEWS 116

SUPPLEMENT

THE PHILOSOPHY OF BOSANQUET
By M. C. Mathew, B.A. (Hons.) 3

GEOGRAPHY—THE FOUNDATIONS OF HISTORY

BY

DR. GEORGE KURIYAN, B.A., B.SC., Ph. D. (Lond.)

The foundations of history are fundamentally geographical. This is obviously true in the sense that the reader of history must learn where the frontiers of states are, where wars were fought, whither colonies were despatched. It is equally, if less obviously, true that geographical facts very largely influence the course of history. Human history unfolds upon the earth and historical facts are always connected with certain places. Even the constitutional and social developments within a settled nation are scarcely independent of geography, since geographical position affects the nature and extent of intercourse with other nations and, therefore, of the influence exerted by foreign ideas. All external relations, hostile and peaceful, are based largely on geography, while industrial progress depends primarily though not exclusively, on matters geographical—viz., the natural products of a country, and the facilities which its structure and position afford for trade, both domestic and foreign.

In the beginnings of human history, before much of the earth was peopled, the movement of nomad tribes must have been determined almost entirely by the natural features of the country. Totally ignorant of everything that was not before their eyes, they would have no motive for attempting to overcome obstacles for the sake of reaching what lay beyond. Accident or caprice might lead them to do so occasionally, but in general, they would take the easiest direction in which to move. It is obviously simpler to skirt the base of a chain of mountains rather than to cross them. Fens are practically impassable obstacles; virgin forests are usually difficult to penetrate, and always bewildering. Rivers, on the other hand, are useful guides, and afford the easiest of routes, assuming the possession of anything like boats. Similarly, it is easy to make a way along the sea coast, and impossible to be lost while the sea is in sight. Such considerations are so obvious that they may fairly be assumed to hold good of the movements of primitive man, though of course there can be no positive knowledge on the subject.

When a new race came in to dispossess prior inhabitants by force, the latter had to escape somewhere, or perish. If they could simply migrate, no doubt, they did so, as the Dravidians apparently did before the oncoming Aryans, and earlier races before the Dravidians. Otherwise, the less accessible parts like the mountains became places of refuge for the dispossessed tribes,[1] where their enemies could not reach them, and had no motive to try, unless it

[1] e.g. the Todas in the Nilgiri mountains who are still in the stage of pastoral civilisation.

were race hatred. If the pressure of the invaders were severe, the fugitives would penetrate deeper and deeper into the recesses of the great mountain chains, and discover ways across them, perhaps to find unoccupied valleys beyond, perhaps to encounter fresh enemies. In this way, while the mountain ridges, large and small, would in general be the natural and obvious barriers between adjacent tribes, exceptions might easily arise, whereby both sides of a ridge were occupied by the same people.

As time went on, as men grew less savage and more settled and learned to live within reach of one another without perpetual war, there would arise a need for recognised boundaries between tribes, or between aggregates of tribes that were making the first step towards a larger union. Geographical facts doubtless in most cases determined these. A mountain chain, or a marshy inlet from the sea, or a belt of dense forest, did in fact lie between one and another, and would become the formal boundary, as having been the actual barrier separating their original haunts. The evidence is equally conclusive that rivers acted in the opposite manner. Before artificial roads came to be constructed, rivers were the best of highways. They facilitated rather than impeded communication between the inhabitants of the opposite banks.

The chief modes in which geography affects the destinies of established nations are through the protecting, or isolating influence of mountain frontiers and through the possession of a sea coast with satisfactory harbours. The environmental influences though not so patent are in some cases equally dominant. Mountains determine political boundaries because they possess a number of advantages in that (i) they form barriers which naturally separate the people on the two sides, (ii) a mountain boundary usually lies in unoccupied lands of little value ; (iii) the crest of a mountain range is often well defined so that there is little question as to where the boundary lies ; in other words the boundary is easily mappable and (iv) such boundaries are not subject to changes like those of rivers.

Spain furnishes one of the best examples of the political value of mountain boundaries. The Pyrenees which cut it off from the rest of Europe are so hard to cross that throughout much of its history Spain has been quite separate from Central Europe.[1]

The importance and value of mountain frontiers are also illustrated abundantly by France and Italy, the frontier between which runs along the crest of the Western Alps, with some insignificant variations in detail. The distance across is from forty to sixty miles according to the route chosen, and there are several available. Only a portion of this distance is more laborious to traverse than ordinary country, not absolutely level. The existence of the Mont Cenis tunnel, moreover, would greatly facilitate transport by one of the alternative routes. Thus, if

[1] Was it not because of this geographic factor that Spain played so little a part in the two world wars of this century ?

either France or Italy held the exits of the passes on the other side of the Alps, it could prepare an attack on its neighbour with no drawback except that of having some thirty or forty miles of the line, or lines, by which its forces are moved and supplied, more difficult than the average. The geography of the region, however, would make it an enormously greater gain for France to hold the eastern slopes of the Alps than for Italy to hold the western. All the routes into Italy, converge more or less on Turin. French invading forces could, therefore, be conveyed into Italy by various routes and would have the maximum facility for concentrating and co-operating beyond the mountains. The converse would obviously be the case, if Italy's armies invaded France.

The results of this geographical formation can be put in another manner. The Italians would know for certain that they must station their defending army somewhere near Turin; the French would have to wait until they learned by what route or routes the invasion was coming. This, however, with the modern facilities for transmitting information and for moving by rail or air, would be but a trifling disadvantage to France, compared with the Italians' difficulty of getting the sections of their invading force into communication with each other or the alternative course of using a single route. Does not this geographic factor account for the House of Savoy ruling over Italy?

Yet another example of the value of mountain barriers is afforded by the Himalayas. Backed as they are by the huge and lofty plateau of Tibet, they are beyond doubt the most formidable natural frontier in the world. From the earliest times, the Mongol hordes of China and Central Asia have been directed on India and no gateway which could offer any possible hope of admittance has been neglected. But the northern passes in the Himalayas not only barred migratory Asiatic hordes through all ages, but have proved too much even for small organised Mongol military expeditions. No modern ingenuity (even including the aeroplane) has as yet contrived a method of dealing with the passive resistance of serrated bands of mountains of such altitude as the Himalayas. No railway could be carried over such a series of snowcapped ramparts; no force that was not composed of Asiatic mountaineers could attempt to pass them with any chance of success; and these eternal defences of Nature's making may well be left a vast silent wilderness of peaks, undisturbed by man's puny efforts, either to improve their strength or to break through them.

It is only in the extreme northwest of the Himalayas that any weakness could be discerned in the chain of defensive works in the north of India. Here the mountain ranges sink to fairly medium altitudes which allow of the development of passes. Here also the mountain ranges narrow down to a width of little more than 300 miles between the plains of India and those of Turkistan. A little to the west of the narrowest part, it is possible to pass round

the western end of the Hindukush mountains without having to climb an elevation of more than 5,000 feet. These passes have been more or less open doors to India through the ages. Men, literally in nations, have passed through them; and the pages of history reveal that the dynasties in India have been changed and her destinies relapsed time after time by the facilities of approach which they have afforded.

The invader from Central Asia has from time to time throughout the centuries pushed his way towards the plains of India over the passes which cross these vast ranges. Afghanistan has always held the landward gates of India through which the great restless human tide has ever been on the move. It is in their deep and tortuous valleys that are found bodies of hardy and fanatical tribesmen, well armed and fearless, unable to extract anything more than the barest pittance from the stony ground where they live and quarrel, but having before their eyes the tempting prospect of booty from the passing caravan, or from a raid into the well settled districts below. Their trade, and indeed their recreation, from time immemorial has been raiding their richer and more peaceful neighbours. Do not these fundamental facts of geography then account for the manner in which history has been moulded in this theatre of human activity?

What has been said so far about mountain frontiers proceeds on the assumption that the chain is, like the Alps or the North West Frontier of India, passable with reasonable facility at various points, though by no means everywhere. If it is practically impassable like the northern Himalayas no question arises; the amount of influence that could be exerted on a campaign by the small handful of men who might cross a really lofty chain is negligible. So likewise, the amount of peaceful traffic across such a chain may be ignored; here and there, under exceptional circumstances, there will be a little, but it is not worth reckoning in the total of national trade.

The lie of a mountain and its relief might play a different part in the history of a country as is exemplified in the case of the Balkans. On a map of the Balkans could be noticed the numerous mountain ranges and the many directions in which they run. Between them lie several plains, some of considerable size like those of eastern Roumania in Bulgaria, and others, mere little pockets among the mountains. Into this region have come many sorts of people. Some, like the Turks, have found a resting place here when want and famine, or hostile invasions caused them to migrate from Asia to Europe. Others, such as the Jugo-slavs, have been forced out of the plains of eastern Europe by similar causes. Thus Montenegrins, Albanians, Serbians, Bulgarians, Greeks, Turks, Wallachs, and Roumanians are inextricably mixed. In a broad plain these people might gradually have become more or less unified, as have the races from which have sprung the English or the French. Each little valley or plain in the Balkan

Peninsula, however, is more or less isolated by a mountain wall, so that the various peoples preserve their own social, political, and religious characteristics. Consequently they are engaged in almost continual quarrels. The Turks, when they were in power, abused and massacred the Christian races until they appealed to the powers of Europe for protection. When the Christians became supreme, they often ill-treated the Turks. In addition to this, all alike have been discontented because of the poverty which generally prevails among mountains, and they have been inclined to attribute their troubles either to their neighbours, or to the Government.

For all these reasons the Balkans have always played a troublesome rôle in Europe. First one great power, then another, and finally all together have tried to bring order out of the Balkan chaos, but always the mountains and the conditions which go with them have baffled such attempts. Austria took possession of the Provinces of Bosnia and Herzegovnia and gave them stable but repressive government, but the mountaineers did not like foreign rule, and the Serbs of Serbia were continually inciting their fellow Serbs of the Austrian Provinces against the Government. When Austria demanded a reckoning with Serbia, the Russians stood by that little Balkan country and thus the great conflict of 1914 was precipitated. Even after the war, various Slavic races of the N.W. Balkans united in the kingdom of Yugoslavia, while Bulgaria, Roumania and Greece remained much as before. At once, there arose great difficulties because Bulgaria and especially Yugoslavia each needed an outlet to the sea, while Greece and Italy wished to keep control over the whole Aegean and Adriatic coasts. Yugoslavia and Italy almost went to war over the port of Fiume, because this was practically the only place where the relief of land gave Yugoslavia a good outlet to the sea.

As a boundary, the coast line is both effective and easily marked and in spite of the unifying influence of the oceans, the sea is an accepted frontier for nations. This is because even a very narrow arm of the sea will serve as an impassable barrier, if the difference in naval strength be sufficiently great. History tells us of several such instances. In 1402 though Timur, with his destroying hordes of Central Asia totally defeated the Ottoman Sultan and over-ran Asia Minor with ease, yet as he had no ships, he was unable to cross into Europe and consequently the relics of the Ottoman power were safe beyond the narrow Bosporus. In 1812-13 England was able to guarantee Sweden against attack by Napoleon's overwhelming land armies across the almost equally narrow straits at the entrance of the Baltic. Likewise, when Napoleon expelled the Bourbon king from Naples, he was powerless to deprive him also of Sicily. Coming down to contemporary times, we know how the narrow straits of Dover have protected Great Britain from being ruthlessly run over by Germany, after she had effectively done so in France in 1940

Another natural feature which in the modern world has come into occasional use as a frontier between states is a river. Historically, or rather pre-historically, when mankind was in the migratory stage, it has already been shown that rivers served the opposite purpose. They acted as guides for the moving tribes, leading them in the direction where there were least obstacles to their advance, to regions which were probably level and fertile. They were convenient highways; it is obviously easier to convey heavy loads in a boat rather than by beasts of burden. Thus, they also facilitated intercourse between opposite banks, so that, as a general rule, both sides of a river were peopled by the same race, instead of its being a barrier keeping alien races, apart. Instances are too numerous to quote, the best illustration, perhaps, is furnished by the Danube. Its whole upper basin is occupied by the Germans, though not politically one, down to where it passes between the extremity of the Carpathians and the easternmost spur of the Alps; and the political frontier between Germany and Austria crosses the Danube, nowhere running along it. Again its lower basin, from Presburg, to Orsova, is inhabited almost entirely by Slavs, though Magyars form the dominant element in some portion of it.

But, in the event of war, when a river has to be crossed, it is a matter of great delay and some risk transferring all the necessary impediments of a modern army over a single bridge, or even several, laid close together. Invasion across a river of any size is a somewhat more serious task than crossing an artificial line; and experience goes to prove that the difficulty lies not in the first crossing, but in the subsequent working. There is always a weak spot here, in the line of communication of the invading army, not only inviting attack by the enemy, but exposed to natural interruption. When Napoleon marched to Vienna in 1809, he found himself face to face with the Austrians across the Danube, the permanent bridges being destroyed. His first effort to cross the isle of Lobau, just below Vienna, failed disastrously in spite of the topography being decidedly favourable to his enterprise. This was because, when the Austrians were barely able to hold in check the forces sent to gain a footing on the northern bank, the bridges into Lobau, from the southern bank broke down, and Napoleon was unable to send reinforcements. The Danube had risen in flood with the spring melting of the Alpine snows and carried away the bridges. It was not until several weeks of delay that Napoleon, with all the resources of the Vienna arsenal at his command, could master the Danube. This is rather an exceptional case, but it serves to illustrate the possibilities which a river frontier offers. And the same is true for both sides; it is obvious that each will have some little protection against the other through adopting the river as a boundary line between them.

Another consideration which frequently governs the strategy of defence is the position of rivers. No condition can be more

favourable for prolonged resistance to invasion than the existence of a series of rivers cutting across the invader's natural line of advance. Each of them in succession protects the front of the defending army; the crossing of each in the face of opposition presents a new problem for the enemy to solve. Permanent bridges can be destroyed, and though the enemy may construct new ones, this is a work of some difficulty in the face of resistance. The tributaries which flow down in succession from the Alps into the Po make of north Italy an ideal theatre of war from this point of view, provided the combatants are facing east and west, as was the case many times over. Since the close of the middle ages, the plain of the Po has been a standing battle ground between France and Austria; the one entering Italy over the western Alps, the other over the eastern. Consequently the line of advance has been parallel with the course of the Po; and its northern tributaries joining it more or less at right angles have furnished lines behind which armies stood on the defensive. The roughly parallel courses of the Oder, the Elbe, and the Weser have served in a similar manner, though less noticeably and less frequently. Perhaps the most remarkable instance of the importance of a river crossing the path of an army is furnished by the Berenzina. Napoleon, retreating from Moscow, had only that one river over which to force a passage. It is not too much to say that, but for misunderstanding and mismanagement on the part of the Russians he must have failed utterly and been compelled to surrender. Even as it was, the relics of his army escaped as a mere mob of fugitives.

Wherever international boundaries fail to coincide with natural barriers trouble is apt to ensue, and this is best illustrated by Germany. Among the world's great nations Germany has politically the most unfortunate boundaries. An understanding of them helps to explain some of the causes of the two Great Wars of this century. The real bad sections of Germany's boundaries are on the east and west. The eastern boundary crosses a featureless plain, while the Dutch boundary on the west is similar, though swampy. The pre-war boundary toward Belgium and France lay mostly in a region of low hills, easily traversed. Commercially such boundaries would have been good, were it not that they gave Germany the mouths of the Niemen and Vistula, rivers which naturally belonged to Russia, and cut Germany off from the mouth of her most important river, the Rhine, where the chief German seaport would naturally be located.

The indefinite character of her eastern and western boundaries was one reason why Germany encroached on her neighbours. In the eighteenth century she annexed part of Poland, and in the nineteenth took Schleswig Holstein from Denmark and Alsace-Lorraine from France. France naturally wanted to recover Alsace-Lorraine, for that region is rich in iron and the majority of the people are French in sympathies. Except along the Vosges mountains in southern Alasace there are no physical boundaries to

separate it from France any more than from Germany. Therefore both countries felt obliged to provide military defences along Germany's western boundary. In the same way on the east, Russia and Germany were not physically separated, and each had constantly been afraid of encroachment by the other.

Among all the great powers, Germany is the only one that has had no real opportunity to expand. Landwards she is hemmed in by powerful countries and seawards her expansion was blocked by British sea power and by the fact that Britain had already acquired a vast colonial empire before the Germans awoke to the value of the colonies. In the distant backward parts of the world, Germany also found it difficult to acquire colonies. In the early days of the modern colonial movement her continental position did not encourage her people to be worldwide traders like the British. Moreover, the many German states were so late in uniting into a strong empire that when at last Germany was able to seek colonies, most of the available territory had already been claimed by other powers. Yet her population was increasing greatly. German manufactured goods were flooding the world, and the country was eager to expand like the other nations of cyclonic regions. Germany, to be sure, obtained a few colonies, such as German East Africa, German West Africa, Kamerun, and part of New Guinea, but they were the scraps left over after the best parts had been taken, and they did not supply the raw materials which Germany so much desired.

She might have spread her influence through the peaceful channels of trade, education, science and friendly intercourse, especially in Eastern Europe and Turkey, just as the United States did in Mexico and South America. For this kind of expansion the German prospects were particularly bright. She was well on the way to success but the process was too slow. Ambitious Germany wanted to achieve world supremacy at a single bound and began to seek to control Turkey. First she went to work to build the Baghdad Railway from Constantinople across Asia Minor to Mesopotamia. The water route from Germany to Turkey is long and is at the mercy of Britain. There is a short and safe land route through Austria and the Balkans. If Germany could control this route together with the Baghdad Railway, she would have direct land route through the heart of the prize that she coveted. The easiest way to work this was through the Germans and Magyars of Austria, the strongest elements in the old Austro-Hungarian empire. Hence Germany combined with these Austrians to gain control of Serbia, through which runs the main railway to Turkey. That helped to precipitate the first world war and again, in a sudden unrighteous outburst and with the infliction of frightful suffering, Germany attempted a sudden expansion a second time in this century with dire results to herself. If Germany had accomplished this result by means of peaceful commercial penetration as was effectively done by Great Britain, the world could have raised no serious objections. Because she disregarded treaties and did deeds

which no civilised people could tolerate, most of the world was against her, and she lost not only her recent ill-gotten gains, but much of her earlier ones in Denmark, Silesia, Poland, and Alsace-Lorraine, and all her foreign colonies.

The map of Europe affords very few natural boundaries so definite and strongly marked, as to justify the assertion that reason and common sense require that they should be also political frontiers. About the British Isles and the Spanish Peninsula no doubt is possible. Italy is almost as distinctly defined by the hand of nature. Scandinavia, but for its comparatively short frontier touching Russia, is as insular as Great Britain. The Carpathians might physically, but in fact do not, form the frontier between Austria and Russia. Beyond these, however, there is hardly a mile of land frontier in Europe which is natural in any valid sense—that is to say, a well marked physical obstacle interposed between peoples differing in race and language.[1]

As a matter of fact, natural frontiers are not often talked of at present, as is well illustrated by the division of India into Pakistan and Indian Union. Other instances are not wanting. The Italians chose to base their claim for further extension of their political boundaries on language, and not on the great barrier of the Alps. So likewise, is the theory that the natural frontiers of France were the Pyrenees, the Alps and the Rhine. Geography of course, lends no support to the last which is the most important part of this claim. About the Pyrenees there can be no doubt, nor about the Alps between France and Italy. Switzerland is from the point of view of physical geography, somewhat of an anomaly, though a most beneficial one, politically. The whole left bank of the Rhine is, however, and always has been during historical memory, as entirely German in race and language as the right bank. It is true that a large river is a good defensible line in modern warfare, and that, therefore, it is convenient to adopt it as the exact boundary, but in this particular instance, it would be almost as reasonable to assert that the Seine was the natural north-eastern frontier of France, as that the Rhine is the natural western frontier of Germany.

As a result of the first World War, the boundaries of Central Europe were recast. From the purely physical standpoint, they are little better than the old ones and the boundaries of Germany had the same disadvantages as before. The Rhine is geographically far less of a barrier than the Vosges mountains. On the east, the German boundary everywhere traversed a level plain that could easily be crossed at any point. The only advantage was that the new boundaries satisfied the racial aspirations of more peoples than did the old. The boundaries of Poland were politically even worse than those of Germany, since Poland was carved out of an open

[1] It remains to be seen whether this geographic feature—the absence of a barrier frontier—will in the fullness of time cause a single nation to be evolved out of Germany, Poland and Russia.

plain. Was not the second World War then the result of such unsatisfactory featureless boundaries?

The location of a country, a factor which is fundamentally geographical, sometimes explains its history in quite a different way. Because she is located between Germany and France, and on the best route from the one to the other, Belgium has suffered many privations. Since the time of the Casears, it has been the road for armies. Lens, Seneffe, Steenquesque, Neen Winden, Malplaquek, Fleurs, Jemappes, Waterloo, are all Belgium names. The famous Barrier cities which the treaties of Westphalia and Utrecht created are in Belgium. This country, if it is not a barrier, becomes a passage, and Germany has sent her armies across the little country twice in this century, in spite of the fact that she had nothing to do with the main quarrels which precipitated such a course of action by Germany.

The economic potentialities and space relations of Manchuria have played a large part in the historical geography of the Far East during the last sixty years. Manchuria is, in fact, the only portion of the Far East which can be described as thinly peopled, and the density of population relative to its resources, agricultural no less than mineral, is very small. It occupies a position strikingly analogous to that of Hungary. In both cases, these grasslands are rich lowlands of 'park steppes' sunk between wooded highlands, the Carpathians and the Transylvanian Alps in the case of Hungary, the great Khingan scarp and the Chang Kwantsai in the case of Manchuria. Both have been occupied again and again by nomad hordes from the interior, especially during cycles of bad years and consequent outpouring of population. Both have been utilised as '*points de appui*' by these steppeland hordes for attack on the peasant populations of the neighbouring agricultural lands, e.g. Hungary as a base by Attila and the Huns for the invasion of Western Europe, and Manchuria by the Golden Horde (Kin Tartars) and, later, by the Manchus for attack on China. In both cases the unsettled conditions of life in the grasslands, accentuated by the dangers coming from the wooded high lands encircling the basins, delayed until relatively very recent times the agricultural development of potentially very rich plains. It was not until the nineteenth century that the systematic agricultural occupation of the Hungarian Plain began. It was not until the Manchu Dynasty was firmly seated in Peking and the northern grasslands were under the control of strong Emperors that the Chinese peasant was encouraged to colonise beyond the limits of the Great Wall.

During the last two centuries, Chinese settlement in South Manchuria has made fairly rapid progress, but nowhere, except in the railway zone, can it be described as close, even in the south, while in the north it is limited to a few scattered communities consisting mainly of men. Fifty years ago when the Eastern advance of Russia began to attract the attention of the world, and

in particular to excite the fears of the rising, but still relatively weak, Japanese State, Manchuria seemed to be a No Man's Land, slipping from the feeble grasp of China and a rich prize for whatever power was strong and aggressive enough to seize it.

Russia was the first power to make a bid for it, and by the end of the 17th century all energies were concentrated on a definite advance to the Pacific. Soon was established and developed the great maritime Province of Primorsk with Vladivostok (which means the Ominous Ruler of the East) as a great naval base, and the next step was to connect this to the great administrative centre of Russia at Moscow by the Trans Siberian Railway. These geographic facts clearly account for the Sino Japanese War of 1894-95 and the Russo Japanese War which followed exactly a decade later.

The natural conditions in Japan have been such that expansion was necessary and it may be worthwhile to reflect upon the fundamental factors of the geography of the Island Empire. The agricultural basis, to which the Japanese authorities rightly attach paramount importance, is relatively very small. Not more than 15 per cent of the superficial area is capable of cultivation, and even under the intensive and scientific methods now employed, there is a considerable and growing pressure of population on agricultural resources, especially in the southern and central parts of the Archipelago. The physical basis for industrial development is quite inadequate. There is particularly a marked deficiency of iron, which is the more serious because Japan has committed herself to the rapid development of the metallurgical industries based on iron. Even a cursory glance at the economic resources of Japan shows that the Japanese industrial development on ambitious lines can only be maintained by extensive imports, more particularly of coal and iron, and that her relations with China and the mainland of Eastern Asia are largely dominated by her mineral needs, by the necessity for raw materials, for assured and expanding markets, and by her desire for a bigger field for agricultural development.

Apart from the enterprise and efficiency of much of her economic work in Manchuria and elsewhere, no candid critic can deny that Japan's policy was partly shaped and moulded by the covetousness and ambitions of Powers whose interests in the Far East are far less vital than her own. As a result of the second World War, Japan has lost all her possessions in the mainland and what the future has in store for her, is more than any one can say. One thing, however, appears certain ; China is no longer going to be the football that she was, on the other hand, she will soon attain her rightful place as the leader of the Far East.

Hitherto, we have been considering about the influences of geographical factors in shaping the history of the old and settled lands. It may now be worthwhile to consider whether any similar trends could be noticed in regions of recent settlement.

When we look back upon the history of America, we see one fact of overshadowing importance, namely, that a wide ocean separated an advanced civilisation and a relatively dense population from a wide, rich, and almost unoccupied continent. This is the mainspring of American destiny. The discovery of the New World was coincident with conditions of discontent and internal pressure in the Old. There followed the unique transfer of a highly developed civilisation, in a short time, to a far distant and isolated land. New ideas needful for human progress had germinated and made a certain growth, as in the cramped spaces of a nursery. They were suddenly transplanted to open grounds far away. All that a change of environment can induce came to them; and thus we see American social and political ideas growing and fruiting in a free field, maintaining continuity with the old, through heredity and frequent reinforcement from the ancient sources, but free from repression, and unfolding in the unsullied atmosphere of a 'reserved' continent. American history, then, is a story of the modern overflow into this New World.

History shows us by repeated instances that the geographical conditions most favourable for the early development of a people are such as to secure to it a certain amount of isolation. For this reason, a highly articulated continent like Europe has proved a forcing-house for nations. Almost every people there has grown up, shut off from the neighbours by barriers of mountain or sea. Of the three leading colonizing nations which came to North America from Europe, it was only the English who appropriated the only part of this continent which could afford geographic isolation in any way approximating that which it had enjoyed in Europe. At the end of the first century of permanent settlement they found themselves in possession of a narrow strip of coast, shut off from the interior of the country by an almost unbroken mountain wall. Sea and watershed drew their boundary lines and constituted at the same time their frontier defences. Only one border was really open, that to the south along the Spanish possessions in Florida.

Beyond this seaboard country lay the great valley of the continent, shut in by the upheaved masses of the Appalachian and Rocky mountain systems, a vast unbroken basin. Here nature offered no obstruction, afforded no protection. The two natural highways into this country, the St. Lawrence on the east and the Mississippi to the south, came into the hands of the French, and consequently gave them control of this extensive territory. It proved, however, too large for them to hold, the very extent of it, scattered their population tempted to the adventurous, half-nomadic occupation of the fur-trader, rather than the sedentary life of the colonist. Here were seen fortified trading posts instead of the agricultural villages which dotted the seaward slope of the Alleghenies. The Appalachian barrier had the effect, therefore, of keeping the colonies to the hem of the continent. It limited them

to a strip of coast, where they were most easily retained under British domination. If they had expanded at an earlier date to the west, England would have found it a much more difficult task to make its power felt over all the area settled. The mere element of distance in a new, unbroken country, would have complicated greatly the machinery of government, while diminishing its efficiency. Furthermore it would have generated in a larger proportion of the population the spirit of the frontier, that is, the spirit of independence. Disaffection towards the mother country would have developed slowly as a chronic disease; and we may think it would have been a long time before the feeling could have gathered strength to break out in rebellion. Held under the thumb of the British Government as it was, disaffection took on the form of an acute attack and rapidly ran its course from protest to rebellion, and from rebellion to independence. More than this, when the conflict did come, the colonies were all of one mind, no matter from what section they came. The spirit of union which animated them can be attributed in no small degree to their close contiguity, while their occupation of a contracted area with their two and a half million population enabled them to operate in a solid mass against the enemy.

It is interesting to note how factors of climate led to the civil war in America. The climate of the Southern States causes them to be one of the best places in the world for the highly profitable crops of cotton and tobacco. Strange as it may seem, this fact has in one way been of decided disadvantage, for it led to the introduction of negro slavery. The early settlers soon found that they could make great profit out of tobacco, only if they had labourers, and when cotton became still more profitable, the need for labour increased. Since the Whites generally become sickly if they worked much out-of-doors in the South, especially in summer, owners of large plantation farms began bringing slaves from Africa. No one then considered this a wrong, and in the early days, slaves were held among the Puritans of New England as well as among the people of the South. In the North, however, slave labour did not pay. In the South, on the contrary, slavery was profitable. The white man was not at his best because of the long summer. A slave, however, could do more than in the North because there was no severe winter to hinder him. In the southern climate even the labour of an inefficient slave furnished more than enough to support himself and his family, and the work of other members of the family swelled the profit to the owner. This was especially true when the prices of tobacco and cotton were high, and consequently slavery persisted there. While slavery thus became entrenched in the South the world was gradually becoming convinced that human slavery is wrong. This conviction easily spread in the North but failed to make headway in the South, since the people were blinded by their great profits. Hence for a time anti-Slavery and pro-Slavery dominated

the politics of the whole country and finally brought on the Civil War. That terrible struggle would never have occurred but for the marked climatic contrast between the North and the South. Even to-day the political divergence arising from the difference in climate between the North and the South still persists in the fact that the Democrats count on the vote of the 'solid South', while the chief strength of the Republicans is in the North.

It is interesting to note that there is no natural barrier to separate the U.S.A. and Canada. The fact that almost the whole population of Canada is thus disposed along the southern edge of her territory, and more than four-fifths of it within two hundred miles of the boundary, is of decisive importance in the political geography of the Dominion. Such a distribution tends to develop direct connection across the boundary, which is not in any sense a physical barrier for any considerable part of its length. The border location of her population deprives Canada of the power of any effective resistance to military aggression from the United States, so long as the disproportion of population gives the latter, a ten to one superiority in available numbers; for the vital points in the internal communications of the Dominion are all in the border zone, and at any one of them, her forces could be far outnumbered. This strategic disadvantage is the justification for the view that 'Canada has been, and is, a permanent hostage to the United States for the good behaviour of the British Empire.'

Thus we see that even in a new country like the Americas, to a large extent the history and political developments are built on the fundamental foundations of geography, be it the topography, drainage or climate.

Hitherto an attempt was made to show the varied ways in which geography directly moulds history. But there are some cases about which all that could be said is that given geographical conditions were favourable to given political developments; it is difficult to say whether they caused them or not. For instance, upon the shores of the Mediterranean, the houses are never scattered or isolated, but always grouped together in small villages or small cities, and often around a rock, more or less steep. Essentially agriculturists as they were, the men of the Mediterranean world, thus grouped themselves in small cities well situated for defence, because they were caught between the nomads and plunderers of the interior—the shepherds of the mountains and dry regions, herdsmen of the great mighty flocks—and the nomads and plunderers of the sea—the professional pirates. Furthermore, the geographical formation of Greece, both the mainland cut up by mountains into many small sections, and still more the numerous small islands, must have favoured the development of separate city states.

Some attention may now be directed towards other geographical factors like environmental influences which have shaped history. Their effects are not so patent as those of mountain

passes or sea coasts, but nevertheless, they are perceptible to a remarkable extent.

Around the great mountainous mass of Tibet, stretch utterly unlike regions; to the south-west and east, the countries watered by the rainy monsoon of summer; to the north, on the contrary, desert depressions, beyond which, forming a transition between these deserts and the great forest or Siberian taiga, is a succession of great grassy plains forming an almost continuous strip of vegetation from Manchuria to the Steppes of southern Russia and over the plains of the same type in Rumania and Hungary. It is the monsoon which allows the multiplication of productive cultivation that characterises India, China and Japan. A wonderful art of cultivation has been developed in these countries, and the abundance of food substances is shown by the density of population, which, without being generally uniform, makes of this domain as a whole, the home of a third of living humanity.

On the other hand, the herbaceous steppes of Central Asia, where the winter is severe, do not permit of an intensive exploitation. Cultivation exists and prospers only upon the edges of the mountains, where some irrigated oases have been established. Everywhere else the natural environment is fitted in advance for pastoral life and this has been the chief region of horse-raiders, small groups of men, scattered with their herds over an immense territory, but forced to be ever on the move, to know in advance and from a distance, the available pasture grounds and the water supplies, and acquiring thus, by the very necessity of their work, a sense for leadership and strategy, which pre-disposed them to the ruling of territory and the command of their fellowmen.

From these steppes have come forth some of the boldest and greatest conquerors of history—Jenghiz Khan and Tamerlane—and one may say that it was by these steppes, by the aptitudes conferred upon a pastoral people, by the geographical subordination to environment, that the qualities and faculties which made their power are explained. To the question, " Of these scattered herdsmen and these small cultivators swarming and crowded in all southern and eastern Asia, which are the ones that have led the world? " the answer is, the former. Until the end of the eighteenth century, even India was subject to the rule of the " Great Mogul ", i.e., of a powerful herdsmen.

History all over the world has, to a large extent, been moulded upon the beliefs of religion, and it would be pertinent to inquire how far even these religious beliefs were dependent on factors of geography. Why is it that both Christianity and Islam picture hell as hot? Hell is the theologian's attempt to portray in figurative language unpleasant things for the future. Figures of speech to be effective must come close home, and speak of things that are well known. The Old Testament Hebrew, in whose land both Christianity and Islam originated, lived on the edge of the desert. To be lost in the desert and suffer the heat and thirst there,

was the most terrible thing imaginable. It was an effective mind that used this idea for the creation of Hell. With equal effectiveness other natural factors like cold, snow, and ice were used. Among the pre-Christian Scandinavians, Hell was encased in snow and eternal ice. To the Norseman, blue with cold, a hot hell sounded too pleasant to be hell at all. According to a story, centuries old, a missionary preached a hell-fire sermon to the heathen Norsemen, when one of the cold ones in the audience replied, "We all want to go to that warm nice place you speak of; but tell us, do we have to be mean, kill fellow beings and create a lot of trouble before we can." Likewise, after a thousand years of War in Palestine, after a thousand years during which that country served as a high road for peoples and as a foot-ball for empires, it was not unnatural that Revelation should have described Heaven as a Walled City. The Koran, written by Mahomed in the centre of the desert of Arabia, presents a Heaven, abounding in cool shade and soothed by the sweet sound of running water, the perfect opposite of the Hell of the neighbouring Jews and Christians, which was also a desert product. A study of world Literature and the world's peoples would yield a surprising variety of Heavens and Hells, each with a geographic explanation.

Yet another illustration could be cited from the Bible to elucidate the rôle of geographic environment. Christ does not find disciples in his own city of Nazareth; on the other hand, he is followed by the fishermen of Galilee. The inhabitants of Nazareth are patient cultivators, whose little gardens may be seen upon the slopes surrounded with walls of white stone. Like all cultivators throughout the world, they are obliged to remain on the land which must be worked; and the horizon of their minds is limited to the walls which shut in their corner of the earth. They are naturally averse to new things and their very work precludes any chance of their leaving home, even though it were to follow the most winning of the leaders of men. The fishermen of the lake, on the other hand, are nomads through the very necessity of their occupation. Fishing is an irregular business, which depends more on chance than anything else and there are some days of exceptional catch, which permit rest and tranquillity for some time and make possible the following of a whim, or the taking of a journey. It is not that the fishermen of Galilee were fatally destined to follow Christ, but the geographical conditions of their environment and their work inclined them, more than the gardeners of Nazareth to allow themselves to be led into Judaea by the Galilean. Do not such interpretations help us to a better understanding of what history tells us?

As with religion, so it is with each of the other great emotions, needs and activities of man. To understand what man has wrought we must study the place—the environment in which he was wrought. We are only beginning to see how profoundly human creations have been shaped by the stage on which the

drama has been enacted. Without an understanding of the geographical factors, history may become merely a string of unexplained or personal episodes, interesting and dramatic, but facts without meaning.

It is equally true that history, or rather human action of which history is the record, affects geography. The natural barriers, which once kept people inexorably apart, are rendered comparatively inoperative by human labour. The civilising value of roads has been strongly felt ever since the days of the Roman Empire, great mountain chains are now crossed by roads, even penetrated by tunnels, so that their separating effect almost vanishes, their protecting value as frontiers is greatly reduced and the large scale transport of air borne troops has made it even more so at the present day.

Although historians must always take account of the climate, the topography, the agricultural products and the mineral resources of the region whose evolution in time they are reconstructing, it does not follow that all this evolution could be explained by geography. Facts of historical geography, that is to say, political, military and administrative geography, depend upon human vicissitudes and do not always have a truly geographical value or meaning. However, certain fundamental geographical conditions, such as topographical situation, altitude, orientation, proximity to the sea, size of the space occupied or conquered, etc., play such a role in the destinies of Cities, Provinces, or States that their history cannot be discussed without due consideration of the geographical surroundings. Human history is deeply rooted in the material things of the earth. Even Napoleon, who certainly was able to modify the map of Europe by his own free will, has frankly admitted that the policy of states is in their geography. In the same way, in the face of the greatly increased power of the financial oligarchies as in the face of social plans, or dreams of political parties, we may say 'every lasting policy and all successful economic movements must be based more and more upon geography.'

MUSIC AND MATHEMATICS

BY

P. SAMBAMOORTHY

There is an order and rhythm in all things pertaining to Nature. In Music, particularly one sees this fact in a patent manner. In the history of human race and culture, music happens to be the earliest fine art to be developed. The primordial scale, though developed without any knowledge of the frequency relationships of notes, was on a later analysis found to take notes of correct musical intervals.

Music is an exact science. The student of Mathematics will find herein the practical application of many of the concepts, series, progressions and formulas. The popular notion that art is something which will not stand scientific analysis is incorrect. The notes used in the musical systems of all civilised countries bear well-recognised ratios to the fundamental. Notes not conforming to these values will sound unmusical and unpleasant. Once the tonic note is sounded the values of all the other notes of the scale get automatically defined. The whole science of music, eastern or western, is based on the fundamental factor of samvāditva or consonance.

TONE SYSTEM

The frequencies of two notes which are an octave apart bear the ratio 1: 2. Thus if the frequency of the middle octave shadja is equal to n vibrations per second, the frequency of the higher octave shadja will be equal to $2n$ vibrations per second. The frequency of the next octave shadja will be equal to $4n$ vibrations per second (i.e., twice the frequency of its immediate lower shadja) and so on. Thus the frequency relationships of the octaves are in the geometrical progression : 1, 2, 4, 8, 16, 32, etc. This is referred to as the *dviguna character* of the octave notes.

This same progression downwards is seen in the concept of shatkālas or six degrees of speed. Herein the value of a note gets progressively reduced from unit time in the first degree of speed to $\frac{1}{2}$, $\frac{1}{4}$, 1/8, 1/16, and 1/32nd unit time in the other five degrees of speed. In other words, one note is sung to unit time in the first degree of speed, 2 notes to the same duration in the second degree of speed, 4 notes in the third, 8 notes in the fourth, 16 notes in the fifth and 32 notes in the sixth degree of speed and so on. In the concept of shanmārgas (Dakshina, Vārtika, Chitra, Chitratara, Chitra tama and Ati chitra tama) in the sphere of tala dasa pranas (10 elements of musical time) also, we see this progression.

The arithmetical progression 1, 2, 3, 4, 5, 6, 7, 8, etc. is seen in the frequency relationships of the svayambhu svaras or the upper partials. These harmonics are heard when a stretched string is sounded. The perception of the consonant note,

Panchama or the Perfect fifth (3/2) constitutes the first landmark in the evolution of the tone system. After the fundamental, the first note in the gamut that was recognised was the Panchama, the third harmonic. The cycles of Fifths and Fourths (or the under Fifths) were logically worked out and the tone system was evolved. It is possible that the study of the harmonic series and the frequencies of the notes belonging to different octaves led early Mathematicians to become cognizant of the arithmetical and geometrical progressions.

The notes heard within an octave bear certain simple ratios to the fundamental. The notes shadja and panchama (C and G) bear the ratio 2 : 3 ; the notes shadja and suddha madhyama (C and F) the ratio 3 : 4 ; the notes shadja and antara gandhara (C and E) the ratio 4 : 5 ; the notes shadja and sadharana gandhara (Komal ga or E flat) the ratio 5 : 6 and so on.

Next to the unison and the octave, the Panchama is the most consonant interval. A pleasant effect is experienced when a note and its Panchama are sounded together. The 22 notes used in the Indian musical scale are the earliest notes to be derived in the cycles of fifths and fourths, eleven notes exclusive of the fundamental in the former case and eleven notes inclusive of the fundamental in the latter case. The significance of the inclusion of the note of frequency 40/27 in the ancient scale, madhyama grama will be clear when it is realised that this note occurs as the eleventh note in the cycle of fourths or sa—ma series. The later notes of the cycle are not of interest from the point of view of practical music. In the following Table, the frequencies of the notes of the two cycles reduced to one octave are given in the increasing order of pitch from left to right. Leaving the two notes shadja and panchama (C and G), it will be found that the remaining 20 notes are distributed amongst the five svaras at the rate of 4 for each. Each note of the cycle of fifths will be found to be a pramana sruti (comma or 81/80) higher than the contiguous note of the cycle of fourths. The Indian tone system is therefore not only evolved on a consonantal basis but is also logical and

	s	r				g				m				p	d				n				s
Cycle of fifths.	1		$\frac{16}{15}$		$\frac{9}{8}$		$\frac{6}{5}$		$\frac{81}{64}$		$\frac{27}{20}$		$\frac{729}{512}$ or $\frac{64}{45}$	$\frac{3}{2}$		$\frac{8}{5}$		$\frac{27}{16}$		$\frac{9}{5}$		$\frac{243}{128}$	2
Cycle of fourths.	1	$\frac{256}{243}$		$\frac{10}{9}$		$\frac{32}{27}$		$\frac{5}{4}$		$\frac{4}{3}$		$\frac{1024}{729}$ or $\frac{45}{32}$			$\frac{128}{81}$		$\frac{5}{3}$		$\frac{16}{9}$		$\frac{15}{8}$		2

Note.—In the above Table, the ratios $\frac{729}{512}$ and $\frac{64}{45}$ differ from each other very slightly; likewise the ratios $\frac{1024}{729}$ and $\frac{45}{32}$. To enable easier calculations, the simpler ratios in both the case are taken for further progressions.

mathematically accurate. The very idea of pramana sruti or comma was perceived when the eleventh note of the cycle of fifths, was reached. This note, it may be pointed out, is a comma higher than the perfect fourth. The fifth of this note again revealed a note which was a comma higher than the fundamental.

Thus the use of ten twins of notes in addition to the shadja and Panchama, the two notes of each twin differing by the interval of a pramana sruti or 22 cyclic cents, is the distinctive feature of the Indian tone system.

With the Panchama, the madhyama was automatically perceived; since the madhyama was only an under fifth. In other words, if of two notes which are related as shadja and Panchama the higher of the two notes is taken as the fundamental, the other note will be found to be the suddha madhyama of the lower octave. Thus the cycle of fourths is implied in the cycle of fifths. The values obtained by the downward (anti-clockwise) progression of the cycle of fifths will be the same as the values obtained in the upward (clockwise) progression of the cycle of fourths. Conversely the values obtained in the downward (anti-clockwise) progression of the cycle of fourths will be the same as the values obtained in the upward (clockwise) progression of the cycle of fifths.

It may be pointed out incidentally that in some rāgas, notes other than the 22 are used but such notes differ from the neighbouring notes of the scale of 22 srutis by such a microscopic interval that they are justifiably enough regarded as reflections or lustrous varieties of the contiguous notes.

The idea of 22 notes being distributed among the sapta svaras is in keeping with the ratio 22/7 or π — the relationship between the diameter and the circumference of a circle.

After the panchama and madhyama, the next note of the gamut to come to the notice of man was the fifth harmonic, antaragandhara 5/4. This note also formed the basis of a new cycle—the cycle of Thirds. Thus the major third of major third is equal to $5/4 \times 5/4 = 25/16$. The Panchama lower down of this note 25/16, is 25/24 or the nyuna sruti interval. The Kampita rishabha of Saurashtra rāga is suggestive of this note. Only a few notes of this cycle are of practical importance.

Scales of Equal Temperament and Just Intonation

In the scale of equal temperament, the successive notes of the gamut form a perfect geometrical progression. They are separated from their neighbours by the same common interval. Any two adjacent notes of the scales of 12 semitones will be found to bear the ratio 1: 1.05946. In Indian music it is the scale of just intonation that is used. The notes used in Indian music are the acoustically correct ones. In the equi-tempered scale which became a necessity in Europe on account of the scheme of harmony, the frequencies of the notes, excepting for the fundamental and the octave are either slightly below or above their true ratios. The

24 JAN 949

difference in the frequencies of the notes in the two systems of tuning is, no doubt, very slight but nevertheless it is a solid and a real difference and can be perceived by a trained ear.

It may be of interest to note in this connection that the notes that figured in the old scale, shadja grama, were described in terms of sruti values thus:—

s	r	g	m	p	d	n
4	3	2	4	4	3	2

Four standing for the major tone (9/8), 3 for the minor tone (10/9) and 2 for the semitone (16/15). In the other old scale ma grama, the interval between the fourth and the fifth was a minor tone. The ni murchhana of this ma grama corresponds to the major diatonic scale of European music and its ma murchhana, to the suddha mela of ancient Tamil music.

Every interval used in an octave has its complementary interval and the sum of these two intervals is equal to the interval of an octave, i.e., 2. The frequency of Panchama $=3/2$. If the Panchama is taken as the tonic note and the shadja above played, the latter note will impress one as the suddha madhyama. Thus the octave is made up of the two intervals, Perfect fifth and Perfect fourth, i.e., $3/2 \times 4/3 = 2$. The difference between the two intervals Panchama and Madhyama is a chatussruti interval or Major tone. $3/2 \div 4/3 = 9/8$.

There are three ways of expressing the values of notes :—

(1) In terms of vibrations per second ; For ex., the frequency of the middle octave Sa $=256$ vibrations per second.

(2) In terms of ratios to the fundamental ; For ex., the value of Antara Gandhara $= 5/4$, Sa being equal to 1.

(3) In terms of cents ; For ex., The Panchama $= 702$ cents (In this calculation, the octave is divided into 1,200 cyclic cents). The calculations herein are worked out on logarithmic basis.

A study of musical intervals reveals the following :—

(1) If of two intervals making up an octave, one happens to be a consonant (samvādi) interval, its complementary interval also is a consonant interval ; thus the Panchama and suddha madhyama—the perfect fifth and the perfect fourth ($3/2 \times 4/3 = 2$) are both consonant intervals.

(2) If of two intervals making up an octave one is a dissonant (vivādi) interval, its complementary interval also will be a dissonant interval; thus suddha rishabha (D flat) and the Kākali nishada (B) $\frac{16}{15} \times \frac{15}{8} = 2$ are both dissonant intervals.

(3) If of two intervals making up an octave one is an anuvādi interval, i.e., neither consonant nor dissonant, its complementary interval, is also an anuvādi interval; thus antara gāndhāra (E) and suddha Dha (A flat) $5/4 \times 8/5 = 2$ are both anuvādi intervals.

The Major chord of European music is a triad wherein the frequencies of the three notes bear the relationships 4 : 5 : 6, i.e.,

1, 5/4 and 3/2. The Minor chord of European music is a triad whose notes bear the frequencies 1, 6/5 and 3/2.

The Panchama or the Perfect Fifth itself is the arithmetical mean of the fundamental and its octave: $\frac{1+2}{2}=\frac{3}{2}$. The Antara gandhara (E) is the arithmetical mean of the notes Shadja and Panchama $\frac{1+\frac{3}{2}}{2}=\frac{5}{4}$. The Chatussruti rishabha is the arithmetical mean of the notes Shadja and Antara gandhara $\frac{1+\frac{5}{4}}{2}=\frac{9}{8}$.

SCALES

The 12 semitones used in an octave are universally known. With these 12 notes as the basis, 72 heptatonic scales have been evolved; 36 of these scales take the suddha madhyama or F Natural and 36, the Prati madhyama or F sharp. The number 36 is the square of 6. Leaving aside the graced utterances of notes in rāgas, it may be pointed out that the Melodic individuality of a rāga is established by using in it notes of defined frequencies in relation to the fundamental. If due to carelessness, a note of faulty pitch is sung, that note sounds as an *apasvara* and gives a rude shock to the sensitive listener. The medodic entity of the rāga is also affected by such careless singing.

All the 72 heptatonic scales mentioned above take the perfect fifth. By substituting F sharp for the perfect fifth in the first 36 melas, the number 72 can be increased to 108. All these are homogeneous scales in the sense that in every scale the notes taken by the arohana (ascent) occur in the avarohana (descent) as well. In the scheme of 144 (the square of 12) scales, the first 72 comprise the present melas. The next 36 consist of a suddha madhyama mela in the ascent and its parallel prati madhyama mela in the descent. In the next 36, it is the other way about—a prati madhyama mela in the ascent and its parallel suddha madhyama mela in the descent. In the scheme of 5,184 (square of 72), suddha—misra melas, there are the 72 chakras or sections, comprising 72 scales each. In each section, the ascending scale is a constant factor and the descending scale progressively varies from the melas of serial numbers 1 to 72. In this scheme of suddha-misra melas comprising the 72 homogeneous melas and the 5,112 heterogeneous melas, the serial number of any one of the present 72 melas is found by the formula,

$$72\,(n-1)+n$$

where n = the serial number of the melakarta in the scheme of 72. The melodic minor scale of European music is a heterogeneous mela and its rank in the scheme of 5,184 suddha-misra melas is 1,604.

Transilient Scales

In addition to the above heptatonic scales, Indian music employs a large number of transilient scales. These scales eschew a note or two in the ascent or descent or both. The total number of transilient scales is 34,776. This number, colossal as it is, does not include the svarāntara rāgas which take only 4 notes either in the ascent or descent or both. Nor does this number include the bhāshānga rāgas and the Vākra rāgas. Thus the statement that the number of rāgas is 'infinite' is literally true.

The total number of svarāntara rāgas that are possible are 92,160. Just as the possible Shādava combinations are 6 and audava combinations are 15, the possible svarāntara combinations are 20. The number 20 is got by deleting the following notes :—

(1)	n d p	(11)	n p m
(2)	n d m	(12)	n p g
(3)	n d g	(13)	n p r
(4)	n d r	(14)	d m g
(5)	d p m	(15)	d m r
(6)	d p g	(16)	p g r
(7)	d p r	(17)	n m g
(8)	p m g	(18)	n m r
(9)	p m r	(19)	d g r
(10)	m g r	(20)	n g r

Svarāntara-sampurna	rāgas	are	...	20
Sampurna-svarāntara	,,	,,	...	20
Svarāntara-shādava	,,	,,	...	120
Shādava-svarāntara	,,	,,	...	120
Svarāntara-audava	,,	,,	...	300
Audava-svarāntara	,,	,,	...	300
Svarāntara-svarāntara	,,	,,	...	400
				1,280

Since in each mela all these combinations are possible, the total number of svarāntara types of ragas for the 72 melas comes to $1,280 \times 72 = 92,160$. This added to the 34,848 heptatonic and transilient scales (exclusive of the bhāshānga rāgas and vakra rāgas), will yield the number of rāgas as 1,27,008. (*N.B.*—About a fifth of this number of rāgas will be found to repeat in one or more melas). Two of the well-known svarāntara rāgas are Navarasakannada and Vivardhani. By using a formula similar to that of the *Nashtoddhishta*, given a number we can find out the form of the arohana and avarohana and the janaka mela of the rāga represented by the number. Likewise given a rāga or a rāga's arohana and avarohana and janaka mela we can find out its serial number.

GRAPHS

The svara-graphs of rāgas present an interesting study. They not only define the contour of the ragas but also throw light on the nature of their arohana and avarohana, their heptatonic or transilient character, their vakra or krama character, the vakra svaras, vakrāntya svaras and the extent of vakratva, janta svaras, dirgha svaras and Kampita svaras if any, the amsa svaras, nyāsa svaras (major nyāsas and minor nyāsas inclusive) and the notes on which one can rest and develop an alapana. The svarasthāna graphs and the srutisthāna graphs of rāgas throw further light on the frequencies of notes used in the rāga. The svarasthāna graphs also reveal if the lower and upper tetrachords are symmetrical or otherwise.

RHYTHM

In the sphere of rhythm, the numbers 4 and 3 play a considerable part. Their sum represents the number 7 which is the total number of svaras and the total number of principal talas. The product of the numbers 4 and 3 is twelve which is the number of semitones used in an octave and whose multiples are represented in the number of melas (72), talas (108) etc.

The 7 principal talas admit of 35 varieties, on account of the five varieties of laghu, Trisra (3), Chaturasra (4), Khanda (5), Misra (7), and Sankirna (9). The laghu also admits of another five varieties and are respectively named divya laghu, simha laghu, varna laghu, vadya laghu and karnataka laghu (6, 8, 10, 12, and 16 connts) and this gives us another 35 talas. Each of these 35 or 70 talas again admits of 5 varieties on account of the *gati bheda*, i.e., division of each count into 3, 4, 5, 7, or 9 minor units of time. This gives us in all 175 or 350 talas.

In addition there are :—

(1) The classical 108 talas making use of all the shadangas (the aforesaid 350 talas make use of only the three angas, Anudrutam, Drutam, and Laghu).

(2) Talas like Sarabhanandanam employing most of the shodasangas.

(3) Innumerable folk time-measures of mixed pattern.

(4) The desadi, madhyadi, druvarupaka and the chapu talas.

In the four varieties of the chapu tala, the existence of the following series may be noted :—

$1+2=3$, Trisra chapu
$2+3=5$, Khanda chapu
$3+4=7$, Misra chapu
$4+5=9$, Sankirna chapu

Note.—In the misra chapu tala, the recurrence $3+4$ is the normal thing; but Syama Sastri has composed many pieces wherein the reversed scheme of $4+3$ is noticed.

Compositions like the sapta tala gita are of special interest. The length of the composition is such that seven different people counting seven different talas and starting to reckon simultaneously with the music will be found to finish with a whole number of avartas at the conclusion of the music. There is the celebrated sapta tala gita, in Nataraga beginning with the words "*Gana vidya durandhara*". The length of the composition = 30 avartas of Dhruva tala (chaturasra jati) or 420 aksharakalas. When the gita is sung once, it will be found that

the person reckoning Matya tala (Chaturasra jati) has completed counting 42 avartas.
" " " Rupaka tala (") has completed counting 70 avartas.
" " " Jhampa tala (Misra jati) has completed counting 42 avartas.
" " " Triputa tala (Trisra jati) has completed counting 60 avartas.
" " " Ata tala (Khanda jati) has completed counting 30 avartas.
the person reckoning Eka tala (Chaturasra jati) has completed counting 105 avartas.

Anuloma and Pratiloma expositions, when attempted for pallavis whose avartas consist of an odd number of aksharakalas will prove very tough. A pallavi in Sama tala consisting of 13 aksharakalas for an avarta has to be compressed and sung to the duration of $6\frac{1}{2}$ and $3\frac{1}{4}$ aksharakalas respectively in the Anuloma stage.

The players of tala vadyas should especially be clever in calculation. When confronted with intricate pallavis from their principals, they should be able to start their crowning conclusions (tirmānas) from the correct fractional point in the avarta so that they will be able to finish correctly and lead the principal in singing the pallavi.

A purely melodic system of music like the one in vogue in India affords scope for the development of certain musical concepts which are either unknown to other systems of music or do not afford the requisite atmosphere there for the origin and growth of such concepts. The concept of tala dasa pranas or the ten elements of musical time is an instance in point. To take only the last element of prastāra, all the possible types of permutations and combinations both of the finite and infinite varieties have been attempted here. There are the prastaras pertaining to svara, rāga, mela and tala. Some of them though not of interest from the point of view of practical music are nevertheless contributions to

pure knowledge on the subject. The prastāras have in each case been classified, named and worked out in full detail. *Khanda prastāra* signifies that the possible number of permutations and combinations is a definite number, whereas *Akhanda prastāra* signifies that the number is limitless, i.e., infinite.

The prastāras are developed according to a plan. Angas that recur should be of a progressively diminishing magnitude. This plan enables one to determine the nature and structure of a phrase, if its serial number is given and to determine its serial number if the phrase is given.

The svara prastaras are a finite number :

The possible combinations with	2	notes are only	...	2
,,	3	,,	...	6
,,	4	,,	...	24
,,	5	,,	...	120
,,	6	,,	...	720
,,	7	,,	...	5,040

The 5,040 svara phrases are of the *sampurna* pattern and the rest of the *asampurna* pattern.

In the sphere of rhythm, there are :

(1) the *chaturanga prastāra*, employing the 4 angas: laghu, guru, plutam and Kakapadam.

(2) the *shadanga prastāra*, employing all the six angas, i.e., the anudrutam and drutam in addition to the above four.

(3) the *shodaśānga prastāra*, employing all the 16 angas from the anudrutam to the Kakapadam. The total number of prastāras herein will run to some millions.

Graphical representation of these prastāras result in interesting geometrical figures.

In *nrittam* or pure dance, the varied aspects of rhythm involving calculations of a complicated nature find full application.

In music the numbers 4 and 3 and their sum (7) and product (12) and squares 16 and 9 play a very large part.

MUSICAL INSTRUMENTS

The shape and construction of the resonators of musical instruments offer a fascinating study from the point of view of plane geometry and solid geometry. The hemi-spherical resonator of the Vina, the bucket-shaped resonator of the svarabat, the cylindrical resonator of the guitar, the elliptical mouth-hole of the European flute, the convex-shaped belly of the tambura, the octagonal-shaped resonator of some rare tamburas, the conical bore of the nagasvaram, the cylindrical bore of the Indian flute, the trapezoid resonator of the svaramandali and the Qanun and the conical drums offer interesting study. The horn plectrum used for playing plectral instruments are of the shape of an isosceles or equilateral triangle.

The parallel strings of the harp and the piano, the parallel frets of the svarabat, the straight frets of the Vina contrasted with

the curved frets of the Sitar, the series of interspaces between the 24 frets of the Vina presenting a series of rectangles of progressively diminishing breadth from the region of the neck to the belly, all deserve notice. In the Vina, the length of the dandi or stem bears to the circumference of the resonator a definite ratio.

Again the cylindrical resonator of the Tuntina and the Guitar, the cylindrical frame of the Kanjira, the barrel-shaped resonator of the mridanga, the concentric rings of skin on the right face of the mridanga, the various figures into which particles of sand strewn on drum-heads of the Panchamukha vadyam arrange themselves into for particular strokes, the straight stick and the bent stick used in playing drums, the disc of the drum Suryapirai, contrasted with the disc with a chord portion cut off, in the drum Chandrapirai, the Kuli talam (tinkling basin cymbals), representing a section of a hollow sphere, the villadi vadyam representing the chord of a big circle and the arched bow of the primitive Ravanastram deserve attention. The acute angle between the string and the stem of the tuntina, the acute angle between the resonator and the arm of the ancient Yal, the obtuse angle formed between the face and the flute, while in the act of playing and the horizontal and perpendicular pegs of the tambura also deserve attention.

A sound that is generated proceeds in expanding spherical waves. The Kampita gamaka is an oscillation of pitch between a maximum and a minimum limit.

The graphical representation of gopuchcha Yati, srotovaha Yati, damaru Yati, mridanga Yati, and vishama Yati will present interesting geometrical figures. When on the face of a mridanga, flour or fine particles of sand are strewn and different types of rhythmic strokes played, the particles will be found to rearrange themselves into interesting patterns of figures.

Mnemonics

In coining the nomenclatures for melas, chakras, svaras, srutis and talas, full use has been made of the Katapayadi formula and the bhuta sankhya. The application of these mnemonical devices is seen in many other Indian arts and sciences.

General

The numbers 5 and 9 also play a large part in the sphere of music. Group Kritis like Pancharatnas and Navaratna malikas consist of 5 and 9 compositions respectively. The frequently used rhythmic phrase *tadhinginatom* consists of 5 rhythmic syllables. The stringed instruments of Europe of the violin variety are tuned in fifths. In India, the stringed instruments are tuned in fifths and fourths.

The comma of Didymus or the small interval 81/80 (Pramana sruti) was known even in the days of Bharata (4th century B.C.). This was the interval that separated the frequencies

of the reduced Panchama string of the ma grama vina and the perfect Panchama string of the sa grama vina. The Greek limma is the Purna sruti interval 256/243. The Pythogorean scale is represented by the notes used in the avarohana of the Devagandhari rāga. In some brass wind instruments, some of the notes are produced by artificially increasing and decreasing the length of the air-column, i.e., by moving up or down the sliding tube or by pressing the keys. In either case, the increase or the decrease in the air-column effected will conform to definite ratios.

The Major tone (9/8) is the interval between the 8th and the 9th harmonic and the minor tone, the interval between the 9th and the 10th harmonic. A melody has one dimension whereas a harmonised melody has two dimensions. Melodic music is therefore styled horizontal music and harmonic music as vertical music. Such concepts, in European music as parallel octaves and fifths, and the movements of parts in parallel, oblique and contrary motions deserve attention. The infinitesimal concept of time is seen in the term *Kshanam* in the tala dasa pranas.

Problems involving a lot of mathematical thinking are also possible in music. Two such specimen problems are given below :—

1. Sing s r g m p d n ṡ – ṡ n d p m g r s only once, at the same time covering all the four degrees of speed in succession. Indicate the manner of singing in notation.

2. Assuming that ten vidvans are drafted to count ten different talas, suggest the name of a song which one can sing and wherein one can find at the conclusion that all the vidvans had finished counting a whole number of avartas. Name the ten talas that you would assign to them and the total number of avartas, that each would have reckoned at the end. Point out also the number of times that the initial beats of the talas of all the ten vidvans would have synchronised. (A pallavi may be suggested in the place of a song and in this case the pallavi may be given in notation and the total number of avartas covered by the sangatis, niraval, anuloma and pratiloma and Kalpana svaras may be indicated separately.)

NAYAR

BY

L. A. Krishna Iyer

The Nayars are found in Malabar, Cochin, and in all the taluqs of Travancore except Shencotta, Thovala and Agastiswaram. They were noted for their martial prowess. About a century and a half of peaceful life has effected a radical change in their life and customs. They are now engrossed in agricultural pursuits and Government service and have earned for themselves the name of loyal peaceful citizens. Education has largely spread among them and they occupy a prominent life in the public life of Kerala. Originally they were a military body, but the Nayars of the present day include persons who, by hereditary occupation, are traders, artisans, oil-mongers, palanquin-bearers, and barbers and washermen. The fact seems to be that successive waves of immigration brought from the Canarese and Tamil countries different castes, who adopted the customs and manners of the people of the country, and assumed the caste names of the more respectable community that surrounded them. Again, the Rajas and chieftains sometimes raised individual or classes who had rendered them meritorious service to the rank of Nayars. These men styled themselves Nayars, though they had no communion with the rest of the Nayars. They numbered in Travancore at the census of 1931, 868,411, of whom 431,154 were males, and 437,257 females. While the general increase of population in 1931 was 27·2 per cent, the Nayars increased by 22 per cent.

Origin and Traditions of the Caste

The word 'Nayar' is derived from the Sanskrit 'Nayaka' a leader, and to be cognate with 'Naik' and 'Naidu or Nayadu'. Moore says that the word 'Nayar' and 'Naik or Nayakan' are derived from the same Sanskrit original and there is considerable evidence to show that the Nayars of Malabar are closely connected by origin with the Nayakans of Vijayanagar. According to Kerala Mahatmyam, the Nayars are the offspring of the union of the junior members of the Namputiri family among whom the eldest son is alone permitted to marry in his own caste, Deva, Gandarva, and Rakshasa women brought in by Parasurama. The Keralolpathi is more rational and says that the Nayars are the descendants of the Sudras who accompanied the original Brahman immigrants from outside Kerala. They practised polyandry and were serpent worshippers and brought with them the Malayan language.[1]

It is believed that Nayar is derived from 'Naga' (serpents), as the Aryans termed the earlier settlers of Malabar on account of the special adoration which they paid to snakes. 'In South India,

[1] Nagamiah, V., The State Manual.

Malabar was the headquarters of the Nagas. It is still the part where Naga worship prevails on a large scale. In the gardens attached to their houses, a cobra (Naga) shrine is invariably found. The Naga worship looks like an organised cult. Some think that the top knot of the Nayar is symbolical of the serpent's hood. In the various countries of the Far East which have been influenced by Indian civilization we find the Nagas in literature and art in Ceylon, Java, China, and Japan. The most essential part of Naga religion is the worship of the earth, both as god and goddess, the giver and the maintainer of life, and the adoration of the snake as the Earth-god's special emblem. The Nagas with their token as serpent spread throughout India from Takshasila to Assam on one side, and to South India and Ceylon on the other. In South India, the Nagas rose to prominence, and not only parts of Ceylon, but ancient Malabar was also occupied by them. Their women were renowned for beauty. Apparently the Nagas had become merged with the Kerala people in the commencement of the Christian era.[1] According to P. T. Srinivasa Iyengar, the Naga cult, the exclusive worship of the serpent, arose probably in the hilly tracts which man inhabited early in the course of his evolution. After the cults of Siva and Vishnu arose, several people remained Naga worshippers without joining these other cults, and were therefore distinguished from the rest of the population by being called specially Nagas. From Nagar the word Nayar is supposed to have been derived.[2]

The most general title of the Nayars in Travancore is Pillai (child) which was once added to the names of Brahman dwellers in the South. It must in all probability have been after the Brahmans changed their title to Aiyar (father) by which name the non-Brahman people invariably referred to them, that Sudras began to be termed Pillai from very early times. The formal ceremony of paying down a sum of money and obtaining a distinction direct from the sovereign was called tirumukham pitikkuka, or catching the face of the king, and enabled the recipients to add besides the ordinary suffix Pillai, the distinctive prefix Kanakku or Accountant to their name. So important were the privileges conferred by it that even Sanku Annavi, a Brahman Dalava, obtained it at the hand of the reigning monarch and his posterity at Vempanur enjoyed the distinction until the present day. The titles Pillai and Kanakku are never used together. A higher title, Chempakaraman, corresponds to the knighthood of mediæval times, and was first instituted by Maharaja Marthanda Varma in memory of his great Prime Minister, Rama Aiyyan Dalava. The individual, whom it was the king's pleasure to honour, was taken in procession on the back of an elephant through the four main streets of the fort, and received by the Prime Minister, seated by his side, and presented with pan-supari (betel). Rare

[1] Krishna Menon, T. K., The Dravidian Culture in Kerala, pp. 75–76.
[2] Srinivasa Iyengar, P. T., Tamil Studies, p. 91.

as this investiture is in modern times, there are many ancient houses, to which this title of distinction is attached in perpetuity. Tambi is another title prevalent in Travancore. It is distinctive suffix to the names of Nayar sons of Travancore sovereigns. Tambis alone proceed in palanquins and appear before the Maharaja without a head-dress. The consorts of Maharajas are selected from these families. If a lady from outside is chosen as consort, she is generally adopted into one of these families. The Thekkumkur and Vadakumkur Rajas are said to have first conferred the title of Kartha on certain influential Nayar families. In social matters, the authority of the Kartha was supreme, and it was only on important points that higher authorities were called on to intercede. All the Karthas belong to the illom sub-division of the Nayar caste. The title of Kuruppu, though assumed by castes other than Nayars, really denotes an ancient section of the Nayars, charged with various functions. The title 'Panikkar' is derived from pani, work. It was the Panikkars who kept kalaris or military schools, but in modern times many of them have taken to the teaching of letters. Some are entirely devoted to temple service, and are consequently regarded as belonging to a division of the Nayars. The title of Kaimal is derived from kai, hand, signifying power. In former times, some Kaimals were recognised chieftains, e.g., the Kaimal of Vaikkattillam in North Travancore. Others were in charge of the treasury, which, according to custom, could not be seen even by the kings except in their presence. Neither could they, writes Barbosa, take anything out of the treasury without a great necessity, and by the counsel of this person and certain others. The term Unnithan and Valiathan was owned by certain families in Central Travancore which were wealthy and powerful. They were to some extent self constituted justices of the peace, and settled all ordinary disputes arising in the Kara where they dwelt. The title Menavan or Menon means a superior person and is derived from mel, above, and avan, he. The recipient of the title held it for his life-time, or it was bestowed in perpetuity on his family, according to the amount of money paid down as atiyara. As soon as an individual was made a Menon, he was presented with an ola (palmyra leaf to write on) and an iron style as symbols of the office of accountant, which he was expected to fill. In British Malabar even now every amsom or revenue village has an accountant or writer called Menon.

Racial History

The Nayars are in the heart of the Dravidian country and possibly belong to the Naga race ; as evidence of connection between the Nagas and Dravidians, a grove is found in the south-west corner of each Nayar house in Kerala. One such grove near Travancore is the property of a family whose ancestors are said to have been spared when the Khandava forest of the Punjab was burned by

Krishna and Arjuna. Each male member of the family was called Vasuka, the name of the king of Patala, the great city of the Nagas. The men are priests of the temple, and the women of the family carry images of serpents in procession.[1] They belong to the Dravidian race, but contain a large admixture of Aryan blood. It is no wonder that they are now a mixed race of Aryans and Dravidians, as the Nambutiris who settled down in Kerala have from time immemorial been marrying the Nayar women. Before the advent of the Aryans to South India, the Dravidians were divided into five groups and each of them occupied a separate region and developed a culture and mode of life suited to their environments. The group which occupied the Kurinji or the hilly country on the west coast were probably the forefathers of the present Nayar community. While living in the jungles they lived by hunting. Later on, they migrated to the low country between the sea and the mountains and took to cultivation. The land was there fertile, and the climatic conditions were very eminently favourable to agriculture. Cultivation was an easy task and it naturally became the occupation of women who remained at home. The men had to guard the rich country against foreign intrusion. Circumstances therefore forced them to develop martial qualities which they inherited from their ancestors.[2]

Fawcet measured 186 Nayars. Their mean cephalic index is 73·1 and mean nasal index 76·8. They are tall. Average skin varies between brown and tawny brown. The hair is black generally. The colour of the eye is black to dark brown. The face is elongated and 15 per cent with prognathism. Due to the system of sambandhum prevalent among them, the younger sons of the Nambutiri contract informal alliance with Nair women with the result that they have a large amount of Nambudri blood. The value of the C.R.L. between these two confirm this intermixture, and show that the absorption of Nambudri blood among the Nayars has been going on at a pace that at the present day the two have been allied in somatic characters, the difference being mostly in integument colours and finer cut features among the former.[3] Racially they belong to the Indide group and form the Keralid type.[3](a) A very long face, as also among the women, and an unusually long, pronounced and straight nose characterises them. These features seem less important if the continuous race mixture is taken into consideration, which has been going on for centuries between the Namputiris and the Nayars.

According to the Brahman tradition, the Nayar caste is the result of the union between the Namputiris with Deva, Gandarva, and Rakshasa women introduced by Parasurama, and this tradition

[1] Perry—The Children of tne Sun, p. 134.
[2] Kunjan Pillai, N.—The Travancore Census Report, 1931, Vol. I., p. 375.
[3] Guha, B.S.—The Census of India for 1831, Vol. I, Ethnographical, p. 35.
[3] (a) Eickstedt—Die Rassenkunde und Rassen-gaschichte der Menschheit, p. 161

embodies the undoubted fact that the caste by its practice of hypergamy has had a large infusion of Aryan blood. In origin the Nayars were a race of Dravidian immigrants, who were among the first invaders of Malabar, and as conquerors assumed the position of the land-owning class. The larger admixture of Aryan blood combined with the physical peculiarities of the country would go a long way to explain the very marked difference between the Nayar of the present day and what may be considered the corresponding Dravidian races in the rest of the Presidency.

EARLY HISTORY

The Nayars were originally a military caste and were noted for their martial prowess. They invariably carried arms which consisted of swords, shields, bows, arrows, and hand-grenades. 'They were like so many Spartan warriors, so many knights of a court of love. All knew how to read and write, but the chief part of their higher education was carried on in the gymnasium and the fencing school, where they cultivated the habit of despising fatigue, careless of wounds, and show an indomitable courage. They went to battle almost naked, threw the javelion with equal address backward and forward and drew the bow with such skill that their second shaft often split the first. Their extraordinary agility made them the terror of every combat in forest. On the smallest provocation they devoted themselves to death, and having done so, one would hold his ground against a hundred. They formed a huge militia class along with other castes and there was a large standing army maintained by the State. Even in the 18th Century, Maharaja Marthanda Varma had a 100,000 soldiers Nayar and Chegos armed with bows and arrows, spears, swords, and battle axe.'[1] In Johnstone's Relations of the most facous kingdom in the world (1611) there occurs the following quaintly written account of this protector guild, 'It is strange to see how ready the Souldiour of this country is at his weapons: they are all gentile men, and termed Naires. At seven years of Age they are put to school to learn the use of their Weapons, where to make them nimble and active, their Sinewes and Joints are stretched by skilful Fellows and annointed with the Oyle Sesamus (Gingelly-Sesamus indicus). By this annointing they become so light and numble that they will winde and turn their bodies as if they had no Bones, casting them forward, backward, high and low, even to the astonishment of the beholders. Their continued delight is in their weapon, pursuading themselves that no nation goeth beyond them in Skill and Dexterity.' Sir Hector Munro, the only British General who had ever to face the Nayars in the field, thus wrote of their fighting qualities, 'One may as well look for a needle in a bottle of hay as any of them in the day time, they being lurking behind sand banks and bushes, except when they are marching towards the fort, and then they appear like bees out in the month

[1] V. Nagamiah, The State Manual, p. 346.

of June.' Besides which, he continues, they point their guns well, and fire them well also.[1] They were, in short, brave light troops, excellent in skirmishing, but their organization into small bodies with discordant interests unfitted them for repelling any serious invasion by an enemy even moderately well organised.

Duarte Barbosa writes of them as follows :—The Nayars are the gentry, and have no other duty than to carry on war, and they continually carry their arms with them, which are swords, bows, arrows, bucklers, and lances. They all live with the kings, and some of them with other lords, relations of the kings, and lords of the country and with the salaried governors, and with one another. They are very smart men, and much taken up with their nobility. . . . . . These Nayars, besides being all of noble descent, have to be armed as knights by the hand of a king or lord with whom they live, and until they have been so equipped they cannot bear arms nor call themselves Nairs. . . . In general, when they are seven years of age, they are sent to school to learn all manner of feats of agility and gymnastics for the use of their weapons. First they learn to dance and then to tumble, and for that purpose they render supple all their limbs from their childhood, so that they can bend in any direction.

It was a custom among the Nayars, which was readily adopted by the Mappillas, who also at times—as at the great Mahamakkam, twelfth year feast at Tirunavai—devoted themselvs *to death in the company of Nayars* for the honour of the Valluvanad Raja. And probably the frantic fratricidal rush of the Mappillas on British bayonets, which is not even a thing of the past, is the latest development of this ancient custom of the Nayars. The martial spirit of the Nayars in these piping times of peace has quite died out for want of exercise. The Nayar is becoming more and more a family man. Comparatively few of them engage themselves in hunting. According to an inscription of King Koluthungal (A.D. 1083–84), he conquered Kudumalai Nadu, i.e., the western hill country (Malabar) whose warriors the ancestors of the Nayars of the present day, perished to the last man in defending their independence.

It is noted by Sonnerat that the Nayars 'are the warriors ; they have also the privilege of enjoying all the women of their caste. Their arms which they constantly carry, distinguish them from the other tribes. They are besides known by their insolent haughtiness. When they perceive Pariahs, they call out to them, even at a great distance, to get out of their way, and if any one of these unfortunate people approaches too near a Nair, and through inadvertance touches him, the Nair has a right to murder him, which is looked upon as a very innocent action, and for which no complaint is ever made. It is true that the Pariahs have for one day in the year when all the Nairs they can touch become their slaves, but the Nairs take such precautions to keep out of the way

[1] Tellicherry Factory Diary, March, 1761.

at the time that an accident of the kind seldom happens.' It is further recorded by Buchanon 'that the whole of these Nairs formed the militia of Malayala, directed by the Namburis and governed by the Rajahs. Their chief delight is in arms, but they are more inclined to use them for assassination or surprise than in the open field. Their submission to their superiors was great, but they exacted deference from those under them with a cruelty and arrogance, rarely practised but among Hindus in their state of independence. A Nair was expected to cut down a Tiar or Mucuai, who presumed to defile him by touching his person; and a similar fate awaited a slave who did not turn out of the road as a Nair passed.'

The Nayars whom the king received in his service were never dismissed, however old they might be. They received their pay and rations, and the king granted favours to whomsoever served him well. If, however, they were left unpaid for some years, some four or five hundred of them aggrieved would rise up and go in a body to the palace, and send word to the king that they would go away dismissed, because he did not give them food. The king would then beg them to have patience, pay them at once the whole amount due to them or a part of it with a promise to pay the balance at an early date. The king generally satisfied them considering it a disgrace that they should go away to serve under another ruler. Even in times of war they were not at liberty to touch any peasant or eat and drink with him in his house without penalty. The king was bound to support the mother and family of any soldier who died in war. He also treated, at his own expense, any soldier who was wounded in battle.

The Nayars thus played a prominent part in the early history of Kerala. Their weapons and modes of fighting thereafter underwent many changes under the influence of the Dutch and the Portuguese, who introduced western tactics and arms into the then existing art of war, when also the Nayars proved equal to the occasion. Colonel Wilke was struck with their pluck and agility. The last event in which they showed their military valour was the rebellion of the Pychee chief of Kurumbranad. With the fall of the Portuguese and the Dutch, and the conquest and annexation of Malabar by the East India Company, the Nayars have almost lost their warlike characteristics through successive generations of peace and have now become attached to the land. In 1855 Captain Druary contrasts the Nayar's effiminate disposition with the martial valour of his forefathers. He now prefers a quiet swing in the verandah or a lounge under a tree, chewing betel. Unlike his ancestors, he is becoming more and more domesticated. They have greatly increased in number and a large majority of them not very affluent, and among these, physical deterioration is noticeable.

[1] Duarte Barbosa, A Description of the Coasts of East Africa and Malabar, pp. 130–131.

Habitations

The Nayars are not lovers of towns. They live in detached houses with large compounds and good gardens. According to *N. Subramania Iyer* the houses of the Nayar, standing in a separate compound, have been by many writers supposed to have been designed with special reference to the requirements of offence and defence, and Major Walsh says that every man's house is his own castle is well verified here. The higher ambition of the Nayar is to possess a garden, wherein he can grow, without trouble or expense, the few necessaries of his existence. The garden surrounding the house is surrounded by a strong fence or hedge. At the entrance is an out-house or patipura, which must have served as a guardroom in mediaeval times. In poorer houses its place is taken by a roofed door, generally provided with a style to keep out cattle. The courtyard is washed with cowdung, and diverse figures are drawn with white chalk on the fence. Usually there are three out-houses, a vadakkettu on the northern side serving as a kitchen, a cattle-shed, and a thekkettu on the southern side, where family spirit is located. These are generally of Maruta, i.e., some member of the family who has died of small-pox. A sword or other weapon, and a seat or other emblem is located within this out-house, which is also known by the names of gurusala (the house of a saint), Kalari (military training ground) and daivapura (house of a deity). The thekkettu is lighted up every evening, and periodical offerings are made to propitiate the deities enshrined therein. In the south-west corner is the surpent grove, and by its side a tank for bathing purposes. Various useful trees are grown in the garden, such as the jack, areca palm, coconut, plantain, tamarind, and mango.[1] The married women do not sleep in the common dormitory; she has one or two rooms of her own, where she can receive her husband, or in former days, her husbands. The fathers showed little interest in the education of the children, a feature not common in other mother-right peoples, which might perhaps be considered an outcome of the Nayar's military occupation.[2]

In view of comparative peace and security of life and property from mauraders, the necessity for massive structures has ceased to exist, and coupled with this, the improved notions of architecture, the rapid progress of education have wrought remarkable changes in the construction of buildings, so that a better class of houses is displacing the old ones with their small, dark and ill-ventilated houses.

Nayar Tarwad

The most outstanding feature in the constitution of a Nayar tarwad is that the system of kinship which obtains is one in

[1] Thurston, Castes and Tribes of Southern India.
[2] Ananthakrishna Iyer, L. K., The Cochin Tribes and Castes, Vol. II, p. 61.

which fathers are practically ignored in the law and descent is reckoned through the mothers. The civil law of the land takes cognizance only of relations on the female line. The constitution of a Tarwad or family of people living together is exceedingly complex. A mother and all her children, both male and female, all her grand children by her daughters, all her brothers and sisters and the descendants on the sister's side, in short, all the woman's relatives on the female side, however distant their relationship, live together in the same block of buildings, have a common table, enjoy all her property, and share it after her death in common with one another. There are at present instances of families with about 200 members belonging to two different branches and separated from one another by generations of descent yet all able to trace their descent from one common ancestress. When by the constant addition of members to a tarwad, it becomes too unwieldy to be governed and managed by one man, natural forces begin to work and bring about a division of it into various distinct tarwads which keep up the original traditions of common descent but have no legal right to the property of one another. These partitions are often so arranged as to bring into separate tarwads closely related members who before belonged to one branch of the original constitution and the kindred sympathies of the members are thus placed on a better and stronger basis of relationship. Over the whole of this group of members living in one tarwad, the eldest male is by legal right appointed Karanavan or managing head. On his death, the next senior male member succeeds to that office in preference to all others. Thus the joint property of the whole tarwad is kept under the management of Karanavan who is legally responsible for its safe keeping as well as for the education of the junior members and for all the necessities arising from its social status.[1] Among them no women ever left her home to take up residence with her husband. The clan or tarwad consisted of all the descendants in the female line of a common male ancestor. *The household* was constituted by the mother and her children, sisters, and brothers, and no husband formed part of it. The husbands were in the strictest sense visitors only and so scrupulously was that position recognised that a Nayar husband would not partake of food in the house of his wife, not being a member of it, but made a point of making his visit after supper.[2]

At the present day much of the social organization of Nayar motherhoods has suffered the disintegrating influence of modern conditions, but the essential rule of matrilocal marriage continues to be adhered to, and aristocratic families refuse to send their ladies out of the home. Throughout South Malabar and North Travancore, it is exceptional for a woman to remove after marriage to her husband's house.[3]

[1] Gopala Panikkar, T. K., Malabar and its Folk, pp. 14-15.
[2] Buchanon, A Journey from Madras, Vol. II., p. 412.
[3] Nagam Aiya, The Travançore State Manual, Vol. II, p. 358.

TRENDS IN THE FOREIGN TRADE OF INDIA

BY

R. BALAKRISHNA

The foreign trade of India has been a sensitive index of a few important factors. Some of them have been generated within the country and others have been of an international character. The growth of industrialization in India has been perhaps the most important local factor which has affected the nature and direction of its foreign trade. The tariff policy of the country which has largely been responsible for the impetus to industrialization has not only altered the composition of the trade, but has also changed the direction to a certain extent due to the difference in the degree of protection in respect of different countries. But for the double line scheme of tariffs in India as between the United Kingdom and Empire countries and others there would have been merely a fall in certain imports and a variation in the composition of its exports.

The Trade Agreements entered into by India with certain other countries have been another important factor affecting the normal course of trade development. They have introduced a bilateral relationship between India and certain countries diverting thereby the natural flow of commodities and canalising them in certain directions. Incidentally they might have also offered an encouragement to an increased export of certain commodities but relatively speaking their influence on the change in the direction is more important than on the quantum.

The currency and exchange policy in India has throughout exerted a strong influence on the country's foreign trade. They are significantly manifested through the different trends in trade with changes in currency policy. Their influence, however, is confined to the quantum of trade and have been responsible only for temporary setbacks. Either the foreign trade has adjusted itself to the new set of circumstances or the currency muddle has been retrieved in due course.

By far the most important influence on the course of India's foreign trade has been the vicissitudes of world trade. India has not had an insulated economy capable of escaping the repercussions of world tendencies. Neither has the course of world trade been steady during the twentieth century. There have been changes in the effective demand of leading European countries and there have also been changes in the policy of world trade. Political influences have by no means remained neutral in their effect either on the quantity or quality of world trade, or on the foreign trade of particular countries.

Lastly the two global wars in the twentieth century have been a special phenomena in affecting the foreign trade of India along with those of other countries. They have not merely disturbed the course of normal trade during their currency but have also

left certain permanent impressions on the pattern of the foreign trade of individual countries. Thus the periodic variations and the temporary setbacks in India's foreign trade are due to the influence of one or other of the factors enumerated above. They have acted either singly or in combination with others.

Demarcation of Periods

The foreign trade of India between the years 1900 and 1944 falls under six important periods having certain characteristic features. The basis on which the periods are delimited are the long-term trends in the variation of the volume of trade. Such variations are also accompanied by changes in the relative proportions of imports and exports. The period from 1900–1913, the first in the demarcation adopted here, was one of steady expansion in trade except for a temporary setback in 1908–1909. There was an adverse balance during this year due to bad harvests and world depression culminating in an exchange crisis in India. But trade recovered soon from this setback and progressed without interruption till the outbreak of the last war. The period of the last war between 1914–1919 indicated a change due to the special circumstances under which trade had to be conducted, such as the scarcity of shipping space and the cessation of trade with enemy countries. The average quantum of trade, however, was more or less equal to the pre-war quinquennium though there was a fall in the early years of the war.

The subsequent period between 1920–24 experienced certain abnormal tendencies in the world, such as a rampant growth of economic nationalism accompanied by tariff barriers. It was also a period of disordered currencies and confused exchanges. In spite of this there was a good recovery in the quantum of India's foreign trade during this period even though a full recovery of trade was not possible. During the next period from 1925–1929 India's foreign trade having recovered fully reached the peak position. There were several favourable circumstances contributing to the attainment of this record. Europe returned to its prosperity and there were no disturbing factors in the growth of foreign trade. In several respects it was a period of perfect stability. The currencies and exchanges of several European countries were stabilized and there was also an adjustment of import and export prices. In India the rupee exchange was stabilized at a new level. The economic effects of the last war were considerably reduced in Europe after the acceptance of the Dawes and the Young Plans. Both exports and imports regained their pre-war dimensions in India during this period. The exports regained their position much earlier than imports.

The years 1930 to 1938 mark the depression and post depression periods. The continuity of progress of the previous period was intercepted for the first time in 1930. Throughout the period there was no chance for trade to recover to the previous level.

Though the effects of the depression were gradually overcome, a few fresh disturbing factors were generated in Europe. It was a period of disintegration of world trade and hence India lost the opportunity of recovery through a multilateral trading system. There was no chance for India to regain her pre-depression quinquennium level of trade. Then followed the last period in our series, namely the war years from 1939–1944.[1] There has been a general tendency for a fall in the quantum of trade during the period even though there was an increase in 1941–1942. There was a definite fall in 1942–1943 and a slight improvement in the subsequent year.

The following table gives the variations in the quantum of trade and imports and exports since 1900.

TABLE I

QUANTUM OF TRADE—IMPORTS AND EXPORTS—MERCHANDISE

Quinquennial averages up to 1937–38

(In Lakhs of Rs.)

Year	Quantum	Imports	Exports
1899–1900 to 1903–1904	209,60	84,68	124,92
1904–1905 to 1908–1909	285,29	119,85	165,44
1909–1910 to 1913–1914	375,90	151,67	234,23
1914–1915 to 1918–1919	385,08	159,25	225,83
1919–1920 to 1923–1924	573,43	267,05	306,38
1924–1925 to 1928–1929	604,53	251,02	353,51
1929–1930 to 1933–1934	359,74	161,14	198,60
1933–1934 to 1937–1938	313,72	145,84	168,68
1938–1939	321,58	152,37	169,21
1939–1940	378,86	165,29	213,57
1940–1941	355,68	156,97	198,71
1941–1942	426,21	173,30	252,91
1942–1943	305,20	110,50	194,70
1943–1944	328,61	117,77	210,84

Variations in Imports and Exports

The variations in imports and exports may be noticed in the table. The imports of India rose up to 1923–24 and there was a slight fall in the next quinquennium. The fall was precipitous after the commencement of the depression in 1929 and imports reached the lowest point in 1943. There was a fall of 35·8 per cent in imports during the depression period as compared with the previous quinquennium. There was no sign of improvement in the position during the subsequent years. On the other hand, there was one more significant fall in 1942–43. Imports fell by 27·6 per cent in that year as compared with the pre-war year of 1938–39.

[1] Foreign trade figures are available only for five years of the war period.

There have also been a few significant changes in the nature of the trade. The imports of raw cotton and cotton manufactures reached a high level in the first quinquennium after the last war. It fell to a third of it during the post-depression period and continued at more or less the same level during the early war years. But there was a further fall in 1943 and a slight recovery in 1944. The imports of machinery increased sharply up to the outbreak of the recent war. This may be explained by the growing industrialization in the country after the adoption of the policy of discriminating protection. There was a gradual fall during the war years but still the imports of machinery were much higher than during the last war. The importation of dyes was at a high level during the recent war, the highest being in the year 1943-44. In the importation of raw and manufactured wool there was a slight improvement during the war years as compared with the preceding periods. There was a fall in the importation of instruments during the recent war. Imports of paper and pasteboard have fallen after 1943. Similarly the imports of drugs and medicines have also fallen after 1943. The imports of hardware have suffered since 1943. There has been a sharp and progressive decline in the imports of glass and glassware since the outbreak of the war. Since 1943 there have also been significant declines in the imports of a few other commodities such as timber, raw and manufactured silk and sugar.

On the export side raw cotton was at its highest during the first quinquennium after the last war. It fell to about 50 per cent of it during 1935-39. During the recent war there was a further fall and particularly after 1941 there has been a considerable decline. The exports of cotton manufactures on the other hand have increased rapidly from 1940-41. As compared with the average of the four years preceding the outbreak of the recent war there was an increase of over five hundred per cent in 1942-43. The export of raw jute rose in the first year of the recent war but fell subsequently. There was a rise in the export of jute manufactures during the first three years of war but there was a slight fall subsequently. The war gave an impetus to the export of jute manufactures. The export of tea has more than maintained its gradual improvement. There was actually an increase in its exports during the war years. The export of oilseeds was steady at a low level till 1943-44 when a sharp decline is recorded. With regard to hides and skins there was no perceptible fall as compared with the years immediately preceding the war. The export of wool has been erratic during the war years except for a rather low figure in 1942-43.

In the following two tables there is an analysis of imports and exports of different commodities commencing from the quinquennium preceding the last war up to the end of the first five years of the second world war.

TABLE I

ANALYSIS OF IMPORTS: SELECTED COMMODITIES

Quinquennial averages—Value in lakhs of Rupees

COMMODITIES	1909-10 to 1913-14	1914-15 to 1918-19	1919-20 to 1923-24	1935-36 to 1938-39	1939-40 to 1943-44
1. Cotton: Raw and manufactured ...	52,20	52,83	73,16	22,10	20,07
2. Machinery and mill works ...	5,61	5,13	21,64	15,34	11,82
3. Dyes ...	1,33	1,06	2,91	3,37	5,40
4. Wool: Raw and Manufactured ...	3,24	1,99	2,61	3,02	3,87
5. Instruments, apparatus and appliances ...	1,35	1,65	3,91	5,48	4,40
6. Paper and Pasteboard ...	1,27	2,02	3,49	3,17	2,90
7. Drugs and medicines ...	94	1,20	1,70	2,14	2,22
8. Hardware ...	3,17	2,79	5,78	2,87	1,69
9. Building and Engineering materials...	78	98	1,66	61	91
10. Glass and Glassware ...	1,61	1,28	2,53	1,32	58
11. Wood and Timber...	78	1,02	1,09	2,70	1,76
12. Silk: Raw and Manufactured ...	3,94	3,93	5,73	2,47	1,00
13. Sugar ...	12,92	13,56	19,71	64	95
14. Total of all imports.	145,84	147,80	254,04	154,40	144,72

TABLE II

ANALYSIS OF EXPORTS: SELECTED COMMODITIES

Quinquennial averages—Value in lakhs of Rupees

COMMODITIES	1909-10 to 1913-14	1914-15 to 1918-19	1919-20 to 1923-24	1935-36 to 1938-39	1939-40 to 1943-44
Cotton: Raw ...	33,27	33,63	64,73	32,19	15,92
Cotton: Manufactures...	11,41	9,72	17,23	7,28	29,96
Jute: Raw ...	22,20	12,80	19,52	14,14	11,08
Jute: Manufactures ...	20,25	40,19	43,16	27,32	46,58
Tea ...	13,06	17,54	20,92	21,96	32,62
Oilseeds ...	24,36	12,17	23,53	14,58	10,80
Oils ...	91	1,87	3,78	1,00	1,71
Hides and Skins ...	10,31	9,88	9,45	4,35	3,90
Wool: Raw and Manufactures ...	2,94	4,10	4,08	3,56	2,74
Sugar ...	16	21	56	28	42
Total value of all ...	219,49	215,96	268,33	169,57	203,17

A more detailed picture of India's foreign trade during the first five years of the recent war is presented in the following two tables. The figures of Exports and Imports of the principal commodities is

given for each year of the war. For purposes of comparison corresponding figures for two years immediately preceding the outbreak of the war are also given.

TABLE IV

EXPORTS FROM INDIA—PRINCIPAL COMMODITIES

Value in Crores of Rupees

Commodities	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44
Grain, Pulse and Flour...	9·49	7·74	5·09	5·92	10·42	6·93	2·31
Tea	24·39	23·39	26·31	27·79	39·57	31·64	37·54
Hides and Skins: Raw...	5·04	3·85	4·11	3·14	4·77	3·38	4·12
Seeds (including nuts for oils)	14·19	15·09	11·90	10·05	10·50	10·52	11·16
Cotton: Raw and Waste.	29·77	24·47	31·04	24·46	17·54	5·31	7·49
Cotton Manufactures ...	...	7·12	8·58	16·48	35·96	46·19	42·48
Jute: Raw	14·72	13·40	19·83	7·85	10·42	9·02	8·32
Jute manufactures ...	29·08	26·26	48·72	45·38	53·89	36·41	49·46
Others	54·24	4·37	48·34	45·82	54·55	38·13	...
Grand Total ...	180·92	162·79	203·92	186·94	237·58	187·63	199·20

TABLE V

IMPORTS TO INDIA: PRINCIPAL COMMODITIES

Value in Crores of Rupees

Commodities	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44
Provisions and Oilman Stores	2·60	2·48	2·63	2·26	2·56	0·71	0·55
Sugar	0·19	0·46	3·32	0·36	1·08	0·02	...
Cotton: raw and Waste...	12·13	8·51	8·05	9·43	15·34	15·42	17·53
Chemicals, drugs and Medicines	6·06	5·62	7·50	8·07	8·76	6·37	7·26
Cutlery, hardware, Implements	6·84	5·81	5·57	5·05	5·44	3·25	2·77
Dyes and colours ...	4·99	4·06	4·67	6·37	6·96	5·43	5·38
Machinery and belting ...	17·98	19·72	15·37	11·82	13·73	10·51	11·39
Paper, Pasteboard and stationery	4·96	3·90	4·11	4·51	4·07	2·16	1·97
Cotton yarn and manufactures	15·55	14·15	14·05	11·35	6·79	1.36	1·34
Other yarns and textile fabrics	11·74	7·08	8·75	9·85	7·64	1·43	0·35
Grand Total ...	173·39	152·37	165·29	156·97	173·15	110·50	117·76

Direction of Foreign Trade

With changes in the volume and composition of trade there have been significant changes in the direction of India's foreign trade during the inter-war period and under the influecne of the second world war. In this respect the important problems for investigation are to ascertain in the first place the groups of countries which are gaining or losing in their respective shares of our exports and imports. Then with regard to either the losing

or the gaining countries it is necessary to find out whether the difference in their position is in respect of particular commodities only or in general. Finally from the standpoint of India it is useful to determine the commodities that have changed direction either on the import or export side.

Taking the Empire and non-Empire countries as two convenient groups for purposes of this study we find that between 1900 and 1913 there was only a fall of 5 per cent in the imports to India from the Empire countries and a gain to an equivalent amount to non-Empire countries. The change in the position was from 1909. The non-Empire countries that shared substantially in the improvement were Germany and Java while Japan and U.S.A. benefited to a lesser extent. The position of the United Kingdom, however, remained undisturbed in 1913 compared with 1900. During the same period in respect of exports the fall in the share of the Empire countries was as much as 16·5 per cent. The countries that shared the benefit are Germany, France, U.S.A. and Japan.

During the next period between 1914-19 in respect of imports there was a further fall of 12 per cent in the share of the Empire. The United Kingdom individually lost as much as 19 per cent of its share. This is due to her preoccupation in the last war. This fall was considerably reduced by Australia and Ceylon by increasing their share. The non-Empire countries gained to the extent of 12 per cent. The most significant year during the period for the change was 1919. The share of the Empire in our exports increased by 15 per cent and there was a corresponding fall in the share of the non-Empire countries. This was due to the exigencies of the first world war. There was a cessation of trade with enemy countries and an increase of exports to the Empire for war needs. The share of the United Kingdom in this increase was only 6 per cent.

During the next two periods from 1920–29 there was a fall of 3·5 per cent in the Empire share of our imports. Though there was an improvement from 1920 the fall commenced after 1925. The United Kingdom was not affected to the full extent of the fall. Its share fell only by one per cent. The gain for the non-Empire countries was due mainly to a revival of trade with Germany. With regard to India's exports the Empire share fell by 18 per cent and there was a corresponding gain for the non-Empire countries. In this fall the United Kingdom did not suffer as much as the other countries of the Empire. She lost only to the extent of 8.5 per cent. Germany had a good share in the increase of the non-Empire participation.

Subsequent to 1930 there was a tendency for a further fall in the Empire share of our imports and by 1935 it fell by 4.5 per cent. This fall was essentially due to an increase in the Japanese trade with India. With regard to exports from India the Empire increased its share by 11 per cent in 1935. The corresponding

fall in the non-Empire share was due to Germany and the U.S.A. The Japanese trade on the other hand increased during the period. During the year immediately preceding the outbreak of the Second World War the share of the Empire in our imports increased by 7 per cent but there was a significant fall in the share of the United Kingdom. The share of the United Kingdom fell by 15·4 per cent. So it was the other parts of the Empire that benefited in the increase. Among the non-Empire countries Japan and Germany suffered whereas there was actually an increase of imports from U.S.A. With regard to exports the share of the Empire increased by 10·3 per cent though that of the United Kingdom increased only by 4 per cent. It was the other parts of the Empire such as Canada and Australia that increased their share. Among the non-Empire countries, in spite of the corresponding fall, U.S.A. and China increased their share. The fall was due to the cessation of trade with Germany and Italy. By 1944 the share of the Empire in our imports fell by another 8 per cent, though the position of the United Kingdom in this respect remained undisturbed. With regard to our exports, while the share of the Empire increased by 6 per cent the share of the United Kingdom fell by about 6 per cent. The reduction in our exports to non-Empire countries was due to the exigencies of war.

The following two tables give the variations in the percentage share of the Empire and non-Empire countries in the Imports and Exports of India.

TABLE VI

DIRECTION OF TRADE : IMPORTS TO INDIA

Percentages

	1901	1914	1919	1929	1935	1940	1944
U. K. ...	63·8	64·1	45·5	44·7	40·6	25·2	25·1
Empire ...	74·6	69·9	57·4	53·9	49·4	56·3	48·2
Non-Empire ...	25·4	30·1	42·6	46·1	50·6	43·7	51·8

TABLE VII

DIRECTION OF TRADE : EXPORTS FROM INDIA

Percentages

	1901	1914	1919	1929	1935	1940	1944
U. K. ...	30·1	23·4	29·2	20·9	31·6	35·5	29·1
Empire ...	54·1	37·7	52·8	34·8	45·6	55·9	61·9
Non-Empire ...	45·9	62·3	47·2	65·2	54·4	44·1	38·1

Taking next the principal commodities in which the shares of the countries trading with India have suffered a decline it is found that there is a general shrinkage in the imports of almost all commodities except a few from the Empire and particularly from the United Kingdom. In cotton manufactures there is a considerable decline to the benefit of Japan. In woollen manufactures the share of the Empire was reduced to a third by 1940. In silk manufactures the imports from the Empire fell to a sixth of its size compared with 1901. With regard to metal manufactures though there has been a fall of about 30 per cent the Empire has a larger share of our imports than the non-Empire countries. Similarly in metals there has only been a decline of about 10 per cent. In mineral oils though there is a slight improvement for the Empire still the proportion of imports from the Empire is relatively very small.

On the export side the non-Empire countries take a larger proportion of India's raw cotton though the share of the Empire has improved. In respect of raw jute there has only been a slight fall in the share of the Empire but the non-Empire countries take a larger percentage. In oilseeds the Empire share has gradually improved and the relative proportions between the Empire and non-Empire countries are more or less equal. With regard to tea almost the entire exports of India have been from the beginning to the Empire countries. The exports of raw hides and skins to the Empire have improved considerably even though the non-Empire percentage is still high. In cotton manufactures the Empire share has always been high and it has grown enormously during the recent war. In jute manufactures the position has not varied much. With regard to tanned hides and skins the Empire has not only improved its share but is taking now practically the entire exports of India.

Examining the problem from the standpoint of the commodities that have changed direction it is found that textile manufactures of all types are being obtained for India to a larger extent from non-Empire countries. Metals and metal manufactures are still being largely imported from Empire sources. So they have not changed their direction as much as textiles. The export of raw cotton from India has been diverted to a certain extent to Empire countries particularly to the United Kingdom. Raw jute, on the other hand, has indicated a slight tendency to divert itself to non-Empire destinations. Oilseeds have changed their direction in favour of the Empire. Both raw and tanned hides and skins are moving in favour of the Empire. While cotton manufactures have changed their direction in favour of the Empire jute manufactures have moved against the Empire, though during the first two years of the recent war the Empire took a fairly large share of it.

Tentative Conclusions

On the basis of the foregoing factual study a few inferences of a general nature may be drawn for the purpose of formulating the future trade policy of the country. There has been a decline in the quantum of India's foreign trade for a few years preceding the outbreak of the Second World War. The level of the pre-depression quinquennium has never been reached. During the period of the Second World War though the quantum has not increased substantially the changes have been rather erratic. In the decline of India's foreign trade, imports have fallen to a greater extent than exports. During peace days it is an indication that a larger share of the home market was being gradually appropriated by the Indian industries. The exports of India have shown a greater tendency to improve than imports. The imports of machinery have increased gradually and kept steady at a fairly high level under all circumstances including the war. But the imports of finished products have suffered a decline. The exports of manufactured products have been on the increase particularly under disturbances like a war, whereas raw products have suffered a decline. It may not be wrong to infer from this tendency that India has a capacity to export manufactured commodities provided the more advanced countries are not actively competing with it. In other words, with the aid of sheltered markets she may be able to expand her industries considerably.

With regard to the direction of India's foreign trade the share of the Empire and the United Kingdom has been declining more in respect of imports than exports. Even the exports of India are kept within the Empire more through trade agreements than by means of natural factors. During periods of war the share of the Empire is maintained at a higher level than during peace days. The normal tendency seems to be to break away from the Empire moorings. Certain products of Indian industry, such as for instance jute manufactures, have a tendency to move away from the Empire. In future therefore it is likely that with a greater industrialization of the country the share of the Empire and particularly that of the United Kingdom may decline in our exports also as it has been in our imports.

The effect of the second World War on our foreign trade was felt only after 1942-43. Till then there was not much difference as compared with the years immediately preceding the war. In fact the quantum of trade actually increased in 1941-42. The year 1943 was a very bad year for imports. During the war Indian exports were in a better position than imports. The exports have been on the increase during the war years. Due to the exigencies of war the share of the Empire has been greater.

Looking ahead there is every probability of India being an exporting country of its manufactured products than an importing country. The export of primary products is not likely to reach again the pre-war standards. When internal planning is actually

implemented this tendency will become an established fact. No doubt the import of capital goods will be high for a fairly long time due to the creditor position of the country and its anxiety to industrialize. However the quantum of India's foreign trade may never reach the pre-depression levels for some time. With greater industrialization the quantum of trade may increase but not until the pattern of world trade changes. Countries that are more advanced industrially should choose to produce such of the commodities which are not within the reach of countries that are still young industrially. So long as the competitive strength of the advanced countries is manifested in goods similar to those that new industrial countries are attempting to produce the world quantum of trade cannot expand.

The retention of trade restrictions by India will not reduce world trade but increase it in the long run. This is because industrialization of backward countries means ultimately a larger foreign trade for the world at large and industrialization of India is possible under the existing circumstances only through trade restrictions. An attempt to increase foreign trade through a mere removal of trade restrictions may have one of two possible consequences. Either it will have an immediate but temporary effect on the increase of trade not improving in any manner the relative positions of the trading countries, or the countries that are more advanced industrially may increase their share of world trade permanently causing unemployment in backward countries possessing potential resources for development. It is obvious from the study of the League of Nations on 'Industrialization and Foreign Trade' that for the increase of world trade the industrialization of backward countries is essential. But the means to achieve this seems to be a retention of trade restrictions alongside of internal planning until such time that the economic structures of backward countries are firmly established. Thus it appears that the method of expanding world trade through a removal of trade restrictions, though sufficiently attractive, may not be really effective in the long run. No doubt much depends upon the manner in which trade restrictions are interpreted. So long as they are meant for constructive purposes such as an acceleration of world production and employment, they have a legitimate part to play in a scheme of expansion of world trade.

THE INDIAN COAL INDUSTRY—SOME PROBLEMS

V. KALYANASUNDARAM

The industry connected with the mining and utilisation of coal in India occupies a leading position amongst the mineral industries of the country, and if the value of its output, its manifold applications in industries and the number it supports directly and indirectly were considered, it will occupy one of the top places amongst Indian industries.[1] Though in existence for over a century now, [2] its present position is none too satisfactory. Many are the problems that face it and unless measures are taken to solve them one of our valuable and essential assets will have been wasted.

Coal in India is largely restricted to two geological formations—the lower gondwanas of peninsular India and the very much younger tertiaries of north-eastern and north-western India. From the standpoint of output the lower gondwanas contribute almost the entire production—98%, leaving only a small less than 2% to the tertiaries, but insignificant though their share in the total production may be, their geographical location has made the tertiary fields locally important—those of Assam for the tea gardens, river steamers and locomotives, and those of the Punjab for locomotives—as these areas are very far removed from the productive coalfields of Bihar.

The lower gondwana coalfields are largely distributed along certain linear tracts [3] of country which roughly coincide with existing river valleys. They are :—

(i) the Damodar valley ;
(ii) the Mahanadi-Brahmani valley ;
(iii) the Wardha-Godavari valley ;
(iv) the Son-Narbada valley ;
(v) the area intervening between the headstreams of these valleys ; and
(vi) the Satpura basin.

The restriction of coal bearing gondwanas to the tracts mentioned above leaves large tracts of country either completely devoid

[1] With the number of jointstock companies and their capital as an index, the coal mining industry with about 210 joint stock companies and an investment of Rs. 9 crores is next only to the cotton textiles. Amongst the mineral industries it stands supreme with an estimated value of its output of Rs. 10 crores.

[2] Regular coal mining started in 1814 and systematic production in 1853.

[3] The gondwana rocks are scattered along certain very definite lines that have the shape of a vast triangle. The main body of the triangle occupies the north-eastern part of the peninsula. One of the tapering angles points towards the gulf of Cambay at the northern end of the west coast, another towards the coast of the Coromandel, while the northern angle reaches the outer zone of the Himalayas in the neighbourhood of Darjheling. The gondwana basins are distributed partly along two sides of the triangle and partly along two cross bars uniting the two longer sides of the triangle ; one of the cross bars coincides to a large extent with the valley of the Damodar river, the other runs roughly parallel to the Mahanadi-Brahmani along a portion of their course. The shortest side of the triangle coincides approximately with the valleys of the Wardha, Pranhita and lower Godavari .

of coal (e.g. Mysore), or which contain coal which is unworkable because of poor quality, uneconomic thickness or other handicaps of the seams. Further the coalfields are concentrated in a small corner of the peninsula and the centre of gravity of present and potential production may be placed somewhere on the border of Bihar, Orissa and Central Provinces. The distance from the producing fields increases away from here; and as the coal has to be railborne over the entire distance, small though the pit head value of coal may be, by the time it reaches upcountry centres like Delhi, Lahore, etc. the price will have become exorbitant, the cost of transport far exceeding the pit head value. Even in coastal centres like Madras the factor of distance makes itself felt in that South African coal is able to compete with Indian coal.

The effects of unequal distribution of reserves are further accentuated by the chronological sequence in their development. Partly by geographical accident—accident of location, and partly by their quality the Damodar valley coalfields came to be developed earlier and have reached a higher pitch of development than those of the rest of India. Amongst them two—Raniganj and Jheria need special mention as they contribute nearly 75% of the entire Indian production; all the fields of the Damodar valley taken together contribute 80% of India's production. It is thus quite clear that there is an overwhelming concentration within a small area of both occurrence and production of a commodity which is almost in universal demand in the country.[1]

Added to a favourable location this region has the advantage of quality. Of a total estimated reserve (depending on some uncertain data to a certain extent) of 60,000 million tons of all kinds of coal, the Damodar valley fields have about 25,650 million tons or 43% of the total; of workable coal[2] they have 10,150 out of 20,000 million tons or 51%; or of good quality coal[3] alone the region has 4,600 out of 5,000 million tons, *i.e.* 92%. The reserves though not so large as are those of U.S.A. (2,000 billions) U.K. (190 billions) or Germany (290 billions) have the advantage of concentration of quality coal in a favourable location. Lastly the concentration of coking coal and its close association with large reserves of high grade iron ore have, by making possible the

[1] Coal in Raniganj came to notice in 1774 and mining commenced in the next year. Located as it is nearest to Calcutta and in close proximity to deposits of iron ore—the ironstone shales in the coalfield itself—it early drew the attention of industrialists. Following this the other fields of the Damodar valley were discovered and opened up. The seasonally navigable Damodar and the early railway link with Calcutta gave the necessary impetus in the early stages; the proximity especially in the case of Jheria, to the rich mineral bearing areas of Bihar and Orissa has further aided this development. Outside the Damodar valley the fields are comparatively inaccessible because of their location in remote forested and thinly peopled areas and in addition, were linked by railways much later.

[2] This is taken to mean coal occurring in seams over 4′ thick, averaging about 20% ash and within a 1,000′ of the surface.

[3] Coal in seams over 4′ thick, averaging about 16% ash and because of the better quality, up to 2,000′ of the surface.

establishment of an iron and steel and its satellite industries, given an additional importance to the region as a producer of coal.

Coal usually contains some mineral matter and this gives rise to ash when the coal is burnt. The ash in coal varies greatly in amount, composition and fusibility and in most Indian coals it constitutes more than 10%. Since good I class coal should not contain more than 7—8% of ash, the bulk of our coal will be considered poor in grade.

Ash in coal occurs in two distinct forms, either (i) finely divided and uniformly distributed among the coal substance—intrinsic ash, or (ii) segregated into bands or lumps, usually consisting of bands of shale with some pyrites, gypsum or calcite-accidental or extrinsic ash.[1] Ash content, if abnormally high, lowers the heating capacity of the fuel and seriously interferes with its commercial value. Transport of high ash coal entails a lot of waste, as the ultimate consumer has to pay freightage on the 'coaly' portion which alone has any value to him as well as on the inert matter.

From the standpoint of composition, phosphorus and sulphur are the two most objectionable constituents of ash. Coals otherwise of good quality are made useless for certain purposes if they are high in either of the two impurities. Unfortunately in India, there are few low sulphur coals with less than 10% ash; quite a number have 12 to 15% and many good quality coking and non-coking coals have 12 to 15% ash and a high moisture content as well—a double disadvantage. It is very desirable that our coals are cleaned with a view to reducing their ash content; otherwise our limited reserves of good quality coal will be wasted by being consumed for purposes for which II grade coal might just as well be used. The intrinsic nature of much of the ash in our coals makes difficult the economic cleaning of the fuel to obtain a product with less than 10% ash.

Coal is a fossil product formed by geological processes operating over millions of years and as a natural wealth cannot be as easily replaced as used. Hence reserves of coal should not be 'exploited' but developed and used on scientific lines so that what is practically a fixed store may be made to serve the longest time—an end which can be achieved by conservation. In view of our limited reserves and of the needs of the future development of our industries, conservation is our most urgent need and the need is all the greater when it is realised that coal is still one of the cheapest forms of industrial energy[2] and in respect of one

[1] Intrinsic ash represents the remnants of the original inorganic salts forming part of the parent material; extrinsic ash represents material imported from outside during the deposition of the parent material of coal formation as well as subsequently.

[2] Brammal, a great engineer predicted in 1881 "I believe the way in which we shall utilise our fuel hereafter will in all probability not be the way of the steam engine . . . I very much doubt whether those, 50 years hence, will then

industry—the iron and steel industry at any rate, it is almost indispensable.

Conservation with respect to coal has two aspects :—

(i) Maximum and efficient extraction consistent with safety in mining;

(ii) Scientific utilisation of the coal mined.

Extraction of coal.

Methods of extraction practised in India are admittedly backward as judged by British standards and the British methods are themselves not so highly advanced as are the American and continental ones. Indian mining is almost entirely manual, machine's share in coal cutting being very small. The non-adoption of mechanical aids may be sought to be justified on the abundance of 'cheap' labour but the very cheapness has been operating against efficiency in mining. The output per man shift (o.m.s.) taken as an index indicates a greater efficiency in England than in India and greater still in America. The higher efficiency in America is partly due to the high degree of mechanisation and partly also to the thickness of the coal seams—the average thickness being over 6'. In so far as thickness is a factor India has an advantage over the British coalfields as the coal here occurs in fairly thick seams with little disturbance and at no great depth below the surface and efficiency could be increased if only we were to use more machinery.

The bulk of the Indian miners are unskilled. The 'miners' are in the main agriculturists who take to mining during the 'off' (agricultural) season. They do not take to it so much as a profession as a spare time job and this is well reflected in the high degree of fluctuation in the number of people working in the mines; this number may very well be taken as an index of the season's agricultural prospects. This apart, the extremely trying conditions of work underground, a work which is beset with danger—a work fit only for beasts of burden as the American would put it—the low wages, the poor facilities afforded them by way of housing, water-supply and medical attention, all tend to make mining not a very attractive profession. When it is remem-

speak of that (steam engine) except in the character of a curiosity to be found in a museum." We find however, that the steam engine is very much in vogue even to-day. Rapid advances have been made in the efficiency of power plants as indicated by the consumption of coal per horse-power of energy generated. Thus in 1870 coal consumption was 10 lbs. per horse-power; 1910—5 lbs. and by 1930 it had been reduced to 2 lbs. per horse-power. But inspite of technical improvements in the efficiency of our boilers and rapid strides in the development of alternative sources of power like oil, water-power etc. (in Europe alone the power generated by falling water has been estimated to be the equivalent of 28 million tons of coal) world consumption of coal in 1930 was a 100 million tons more than that in 1913, and within the last 30 years coal consumption has more than doubled itself. All these can be explained partly by the cheapness of coal as a source of energy for a variety of industries.

bered that even in Wales, where the mining profession is almost hereditary there is a certain apathy with regard to mine work, one can very well understand the labour side of the Indian coal problem. A change in the attitude of the mine owners, a realisation of their obligation to the labour force in the matter of providing them with the facilities referred to above and the giving up of the contractor system of getting labour would go a long way to make work in the mines attractive and worth while for men to take to as a profession. This and the training of miners in the scientific methods of mining will raise the efficiency of the miner.

In the matter of extraction there has been a great deal of wastage and many millions of tons of valuable coal have been lost.[1] Coal occurs as thick or thin seams interbedded between shales and sandstones. In the process of extraction 'pillars' of coal are left standing to provide support to the roof and to prevent it from collapsing over the goaf i.e. the area from which coal has been removed. Though the crushing strength of coal is high the provision of smaller pillars than necessary leads to spontaneous combustion.[2]

The pillars represent a potential reserve when the time comes for their removal but the potentiality can be realised only when alternative methods of giving support to the roof are adopted. In Jheria coalfield alone coal standing in pillars is estimated at 132 m. tons.[3] Since the opening of the field, 210 m. tons have been raised to the surface and this has meant the entire loss of 16 m. tons by fires, collapses etc., and the locking up of 132 m. tons in pillars—a ratio of coal raised to coal lost (temporarily and permanently) of 60 : 40. At this rate of extraction our limited resources will have been expended in a few years. Besides, the life of a coalfield as developed in India to-day depends not so much on the total reserves in the field but upon that contained in one or two seams.[4] Hence the need for a more efficient extraction in our coal mines will be appreciated.

[1] 'Even if large reserves of coal have not been irretrievably lost, the methods of the present are bound to become more dangerous and expensive and this is undoubtedly reflected in the increased accident rate and cost as compared with that twelve years ago.' A. Farquhar : Symposium on the conservation of coal in India ; Bulletin No. 1 Geol. Min. Metal. Soc. India.

[2] The crushing strength of coal is high. In deep mines when the pillars are small the want of lateral support from the material that has been removed from the galleries around the pillars, the side coal crushes resulting in fires and subsidences.

[3] N. Barraclough: Rec. Geol. Sur. India, Vol. 62 pp. 377 to 384.

[4] (*a*) *The Mohpani* colliery which was acquired by the G.I.P. Ry. in 1903 with an estimated reserve of 7 m. tons was abandoned in 1927 after about 1 m. tons— barely 15% of the total reserves had been extracted. (*b*) *Singareni* has several seams of which the King seam alone was being worked. After allowing for all losses the seam was estimated to contain 36 m. tons in 1893. By 1933 when not more than 20 m. tons had been extracted attention was diverted to other areas like Tandur and Kothagudem. This is inexplicable, especially in view of the fact that in addition to the further available reserves in the King seam itself, there are the thick seam and several others practically untouched ; under the present methods of mining therefore, the life of a coalfield will be considerably shorter than that indicated by the ratio of average annual output to total reserves.

Depillaring to extract the coal locked up in pillars, ensuring the safety of seams both above and below and a high degree of efficiency in extraction can be best achieved by (i) planning on a coalfield basis rather than mine by mine. This will lead to a more rational development of a field and will also reduce to a minimum the wasteful and long trek from the shaft to the working face of a mine. The presence of a number of small rival coalfields close to one another is a witness to the lack of such a plan. (ii) the general adoption of sandstowing i.e. packing the goaf with some solid material.[1] This will render possible the extraction of coal standing in pillars, enable the achievement of maximum extraction in virgin areas, will ensure reserves to posterity and reduce subsidences etc., to a minimum. In addition, sandstowing will lead to other benefits such as

i. the elimination of underground fires;

ii. the possibility of extraction under railways, rivers, buildings etc.;

iii. conservation of upper seams of inferior quality for posterity; and

iv. in the case of the Damodar valley fields the removal of sand from the river for stowing purposes by reducing silting lower down the course will prevent the recurrence of floods and also reduce the likelihood of the river changing its course and spoiling valuable lands in the Burdwan district.

Sandstowing, however beneficial it may be, is little practised in India and even in fields where it was formerly practised it has now been given up. The real obstacle against the general adoption of this measure is the selling price of coal which is so low as to render stowing uneconomic. The selling price of coal is determined by the tenders quoted by the State Railway collieries. The railways as the largest consumers of coal in the country and as an important producer-consumer, by tendering its good coal at a low price, so lowers the market price that it can purchase all its requirements at the same price. This leaves such a low margin of profit to the other producers as not to encourage, much less to render practicable any form of stowing. The State as the custodian of the interests of unborn generations will have to take some initiative in this matter as will make for efficiency in mining.

[1] According to Mr. Farquhar who has made a detailed study of standstowing, the ratio of sand stowed to coal raised varies from 1·8 in virgin seams to 4·8 or more in old areas. He opines that stowing will not be an economic proposition (i) in areas with more than 35% of initial extraction and (ii) in the case of inferior grade coals; in the latter case the selling price of such coals would be under the figure necessary to render possible stowing and partly also because there may be no shortage of this class. Abundance may not be taken as a criterion to justify the continuance of a faulty practice that will deprive the future generations of their share of nature's gifts. Similarly stowing in old areas with more than 35% of initial extraction cannot also be condemned on the ground of cost. In a working colliery where there is virgin coal and pillar extraction, if the cost of stowing were distributed uniformly over the whole output instead of on virgin coal and pillar extraction separately, it would be possible to have development work going on simultaneously with pillar extraction without the cost being prohibitive.

Utilisation of coal

The following table indicates the relative importance of the major consumers of coal in India :—

Railways	33·5%
Iron and steel industries	24·2%
Collieries and wastage	10·2%
Textile mills	8·1%
Bunkering	6·1%
Other miscellaneous uses	17·9%
	100·0%

Of the various consumers of coal, the iron and steel industry needs special consideration. They consume about a quarter of the total and are second only to the railways in the amount consumed. While the majority of the other consumers use coal for steam raising, a purpose for which almost any kind of coal will do, the iron and steel industry requires a special variety called coking coal[1] for use in smelting operations. Coal to be converted into coke for metallurgical purposes must possess in addition to caking character, an ash and moisture content less than 20% and 5% respectively. Though the qualities that determine the coking character of a coal have not been understood well, it has been observed that moisture in coal determines caking propensities to a large extent; thus with a moisture content greater than 5% a hard coke is rarely obtained even though the ash may be low. Judged by these standards our reserves of coking coal are extremely limited—about 1,700m. tons[2], and if semi-coking coals were included the total may not be much in excess of 2,000 m. tons.

The present size of our iron and steel industry is such that its demands of this class of coal are not high :

	(1938)
The two iron and steel companies ...	2,164,486 tons.
Others	473,166 ,,
Total coal used	2,637,652 tons.
Hard coke manufactured ...	1,866,853 ,,
Total coal production of India ...	28,342,906 ,,

[1] Any variety that yields a hard, silvery, porous cake when heated out of contact with air is referred to as coking coal or metallurgical coking coal.

[2] Reserves of coking coal in millions of tons.

	0′—1000′	1000′—2000′	
Jheria ...	737	163	
Raniganj ...	73	168	
Bokaro ...	270	245	
Giridih ...	38	...	
	1118	576	1694 (Total)

If semi-coking coals of Raniganj, the W. Bokaro and Karanpura were included the total may be placed at about 2000 m. tons. A more detailed classification of coking coal reserves is included in the Rec. Geol. Sur. Ind. Vol. 64.

This means that every ton of coke manufactured will have consumed about 1⅓ tons of coal. Taking the quantity of coal consumed as an index of the capacity of our iron and steel industry and allowing for a doubling of our iron production, consumption of this class coal may be increased to about 5m. tons in the near future; the reserves may then be expected to last for about 400 years on the basis of cent per cent extraction.

The demand for caking coal is not distributed uniformly but concentrated upon one source as the table below shows:—

SOURCES OF COAL USED FOR CONVERSION TO COKE

Jheria	2,472,182 tons	93·8
Raniganj	83,925 ,,	3·1
Giridih	72,240 ,,	2·7
Bokaro	6,777 ,,	·3
Lakhimpur (Assam)	2,528 ,,	·1

Field		*Production*	*% of Indian production*	*% of production coking in quality*	*Coal used for conversion into coke*	*% of coal converted into coke to total production of the field*
Jheria	...	9,601,230	38·5	85	2,472,182	5·72
Raniganj	...	7,196,324	28·74	30	83,925	1·2
Bokaro	...	2,309,170	9·22	100	6,777	·3
Giridih	...	674,794	2 78	100	2,2407	10·7
Lakhimpur	...	218,488	1·00	100	2,528	·9

From the tables given above it will be clear that

i. only one eighth of the country's production is used for the production of metallurgical coke;

ii. there is an entire dependence of hard coke manufacturers on the Jheria coalfield;

iii. the entire output of Bokaro and Giridih and almost the entire output of Jheria is coking in character; and

iv. in the case of Jheria and Giridih only a small fraction —one fourth and one tenth respectively of the output is used for the purpose for which it is naturally suitable, the remainder—the bulk being wasted for steam raising for which this quality is not at all essential.

The best coking coals are in Giridih and Jheria. 9 m. tons out of the 38 m. tons in Giridih are extra high in quality with an extremely low phosphorus content. It is therefore suited for special metallurgical purposes such as the manufacture of high grade ferromanganese; India's requirements of ferromanganese are not much and there has been very little ferromanganese production for export purposes. Almost 90% of Giridih's production of high grade metallurgical coal is being wastefully used for steam raising in railway locomotives.

The next best coking coal is obtained from two particular stages of Jheria coalfield—the Bhagabhand and Jialguri stages. On an average these two stages have been contributing about 85% of Jheria's production and it may therefore safely be taken that 85% of Jheria's production is of coking character; but of this rather less than a third is used for metallurgical purposes. On the basis of the average production during the last few years the life of this field's coking coal reserves would range between 33 and 100 years from 1932. As there is an overwhelming reliance of hard-coke manufacturers on the Jheria coal it is very essential that the coking coal reserves of this field be conserved.

Other than Giridih and Jheria, eastern Bokaro (515 m. tons) and Raniganj (241 m. tons) may be considered as store houses of coking coal but they are not so good in quality as are those of Giridih and Jheria. It has however, been found by experience that semi-coking and non-coking coals of Raniganj, western Bokaro and Karanpura yield good coke on admixture with strongly coking coal from Jheria. The adoption of this practice will tend to extend the life of our coking coal reserves substantially. The only other field that may be considered is that of Makum in Assam. As indicated earlier the coal of this field is of very good coking quality with low ash but the sulphur content however, is so high as to render it unsuitable for metallurgical purposes. Experiments on this coal by Randall[1] have shown the futility of existing physical methods of removing sulphur in the coal. It may however, be possible that by mixing the low ash high sulphur Assam coal with a fairly large quantity of low sulphur coking coal of Jheria, the sulphur can be diluted to a degree in the coke that the smelter will accept. But the difficulties of mining, the great distance from the iron ore deposits and the recent division of India negative the prospects of this being considered as a reserve of coking coal for the Bihar and Bengal iron industry.

It will thus be clear that our reserves of coking coal are strictly limited and there appears to be no prospect of any new discoveries of coking coal elsewhere. When set off against our known iron ore reserves our poverty in coking coal will be made more clear. Near about the Damodar valley fields there occurs one of the richest deposits of iron ore in the world. Reserves of ore averging over 60% of iron alone run to over 3,000 m. tons and there are large quantities of lower grade ores in the same neighbourhood, not to speak of the deposits in other parts of India. On the basis of one ton of coke for every ton of ore we do not have enough coking coal to smelt even our first grade ores, not to speak of the other grades here and elsewhere. Hence the need for conserving this class of coal will be appreciated.

The most obvious method of conservation will be the restriction of the use of coking coal for metallurgical purposes alone.

[1] Rec. G.S.I. Vol. 75 Profl. Paper No. 11, p. 38.

Dr. Fermor objects to such a policy of restriction and suggests that if only preventable wastes (losses in mining, etc.,) are avoided, a substantial step towards conservation will have been taken. While admitting the need for avoiding preventable wastes it should be conceded that nothing is lost and something is to be gained by such a restriction. In a symposium conducted by the Geological, Mining and Metallurgical Society of India[1] the need for such a reservation was voiced by a number of members in the following terms :—

i. that the coking coal reserves should be nationalized and a separate coal issue board should be established for the distribution of this class of coal;

ii. coking coal to be used for metallurgical or other purposes where such coal is absolutely necessary;

iii. metallurgical coking coal not to be used for locomotive boilers;

iv. ban on export of coking coal; such export to be replaced by export of selected grade non-coking coal;

v. metallurgical coal to be sold at a premium of a rupee or two above that of the ordinary coal; the amount realised thereby to be spent on sandstowing.

These methods may be objected to on the ground that (i) that conservation simply postpones the evil date and (ii) that there are possibilities of other sources of power coming into vogue largely superseding coal. As against the latter, attention may be drawn to a statement made in another context (cf. Brammal's remarks). Taking into consideration technological developments and improvements including even those made during the II world war it looks pretty clear that coal will continue to remain on the field for quite a long while yet.

The mere restriction of the use of coking coal will not have solved the problem unless other grades of coal are made available for general purposes. The existing boilers have been designed for the use of high grade fuels as are available from the Damodar valley fields. It has, however, been demonstrated that they may without difficulty and at little expense be adjusted to the use of lower grade fuel as well. It is a good augury to note that the Railway Board has been going in for coal of other than selected grade and it may be hoped that before long it will have converted all its locomotives and such other hitherto consumers of good grade coal, into consumers of other than those grades.

Apart from the problem pertaining to coking coals there is the question relating to lower grade coals. There is unanimous agreement in the immensity of our reserves of these grades. But they are little used at the present day due largely to the general low price of coal which renders the mining of all but the best grades uneconomic. The result is a wasteful utilisation—a drain on the

[1] Bulletin No. 1, Geol. Min. and Met. Soc., India, p. 6.

limited reserves of our better grades. Scientific utilisation needs a knowledge of both proximate and ultimate composition of coal. While the proximate composition of coal in the several fields is known in a general way there has been practically no work on ultimate composition. In the absence of a knowledge of these characters the buyer of coal suffers from a serious handicap. Knowledge of these characters will give an index to the value and classification of coal that will be helpful both to the seller and buyer alike and incidentally it will help in devising a system of valuating Indian coals with a view to encouraging the purchase and sale of coal on analysis and to specifications with a provision for penalties and premia for departures from the terms of specification. In the matter of fuel research, India has been lagging behind even its next door competitor in coal trade—South Africa. With the laying of the foundation stone of the Fuel Research Institute at Dhanbad we may hope that ere long this aspect of the problem will receive the attention that is long overdue and that the coal industry will develop along scientific lines.

The coal grading board's classification into selected, I, II and other grades has partly been responsible for the wasteful utilisation of our fuel. If our coal had been classified on the basis of utilisation as for example, coal for metallurgical purposes, gasification, steam raising, low temperature and high temperature carbonisation, hydrogenation etc., it would have done a great service to the industry. With the projected functioning of the Fuel Research Institute and the consequent systematic physical and chemical survey of the various Indian fields, laboratory and medium scale investigation of washability of low grade coals, large scale briquetting tests etc., this object may be achieved in the not too distant future. Carbonisation and hydrogenation need special consideration as by these methods coal may be used as raw material for the production of petroleum. India's resources of this very valuable source of energy for internal combustion engines are very small—the oil fields of Assam and the very much smaller fields of the Punjab (the latter has gone out of the Indian Union) being our only sources of this commodity; and any attempt to step up production of this commodity will therefore be welcome. Besides, these treatments find a use for our immense reserves of the inferior grades. In Germany which has made enormous strides in this direction, the basis of the synthetic oil industry was the lignite in which the country abounds. Investigations carried on in England have proved the adaptability of the bituminous coals also for the treatment. There is every reason to hope that our reserves of inferior grades may be utilised for this purpose.

Apart from utilising such of those lower grades as are suitable for synthetic oil production ways and means must be devised to utilise these grades for general purposes as well. The change in the attitude of the State Railways has already been indicated. As the largest consumer of coal in the country the change over to

lower grades by the railway will mean an enormous saving in the consumption of better grades. But even then we will not be utilising the energy latent in coal to the maximum advantage. Most coal burning engines convert less than 8% of the coal's heat units into power. This low efficiency of steam locomotives and the relatively low calorific value of the lower grades of coal will make the transport of such grades uneconomic. There may be two or three alternative solutions to this problem.

i. To liberate the energy latent in coal in the coalfield itself and distribute the energy in an easily transmissible form. Advances in the technique of long distance electric transmission have greatly enlarged the radius of the range of supply of generating stations. The lower grade coal may be used for producing thermal electricity[1] in large central power stations suitably located in the coalfield itself; a power station, say for instance in the Jheria coalfield will have a central location, and could be easily linked up with the existing power stations of Patna and Monghyr in the north and Jamshedpur and Calcutta in the south and east respectively as well as with the proposed water-power projects of Tista valley, Kosi river, Damodar valley, Mahanadi etc. Such a gridded network of hydro and thermal power stations can supply energy to all the different consumers in the highly industrialised corner of the country, and if the railways, converging on Calcutta and round the coalfields were to be electrified we will have achieved quite a large measure of efficiency and conservation.

ii. Experiments conducted by the fuel conservation section of the U.S. Shipping Board and other technical bodies have proved the high efficiency of pulverised fuel. The advantage of the pulverised fuel engine over the stoker fired one lies in (*a*) the nearly perfect combustion of the fuel, (*b*) the maintenance overlong periods of high boiler efficiency, (*c*) a reduction in the fuel cost, (*d*) an increase in speed in the case of mobile engines and (*e*) a

[1] The advantages of generating electricity in the Damodar Valley Coalfields from the heat energy latent in coal, over harnessing water power potentialities are :—

a. Thermal electricity where coal is available in plenty will be cheaper than hydroelectric power.

b. The coal proposed to be used is of low grade and hence will be cheaper than normal grades; the handicap of lower calorific value may be more than offset by utilising the coal in a pulverised or powdered form whereby higher efficiency can be achieved.

c. Water power sites are separated from the markets by a fairly long distance of country which may not be able to consume any large amount of the power generated whereas the thermal stations will be located in the midst of a large, populous and highly industrialised area i.e. in the midst of a well developed market.

Pulverisation and other methods of utilising coal will suit admirably the recently proved deposits of lignite in the Madras presidency. In the absence of coal and with the prospect of industrial development requiring large amounts of energy which may be in excess of that which can be handled by the developed and projected water power sites, the utilisation of lignite for the generation of thermal electricity will be the most obvious step.

reduction in the fire room crew. It is nearly as efficient and flexible as an oil fired engine, but cheaper. In addition to its adaptability to ordinary boilers without many alterations it has this advantage as far as India is concerned viz. that pulverisation permits of a greater variation in the quality of fuels—coals of low grade with high ash and moisture content being as readily used as are better grades. The real factor that will determine the practicability or otherwise of pulverisation will be the cost of labour and the price of fuel landed at the boiler plant. With relatively cheap labour available in our country, and with improved and efficient methods of mining, it should be possible to place low grade coals at cheap rates at the power stations and the economies effected in labour and fuel and the advantage of flexibility accruing from the use of pulverised fuel will far outweigh the initial cost of pulverisation. At present the cement kilns are the only consumers of pulverised fuel.

iii. Most recently a method has been devised whereby an internal combustion engine can be fed directly with powdered coal instead of oil. What has been a dream of mechanical engineers for over 50 years has come true as a result of the success of the attempts of John I. Yellott, Chief of the Institue of Gas Technology in Chicago. His blue print locomotive using powdered coal will be 3 to 4 times as efficient as today's coal burning engines. As energy is supplied directly by coal without the intervention of steam it will not need water—a great advantage in arid and semi-arid regions; there will be no smoke nuisance. An engine one-fourth the size of a diesel electric or ordinary steam locomotive will deliver an equal amount of power and what is most important is that it will use any kind of coal, even lignite. Though not so efficient as a diesel engine—the new locomotive will deliver only 24% of the power potential of the fuel as against the 36% of the diesel—the low cost of coal which will be only $\frac{1}{3}$ as much per heat unit as fuel oil for the diesel, will more than offset the diesel's efficiency advantage. The absence of large local supplies of diesel oil in India which will tend to make it (diesel oil) even more costly than in a country like America—and it must be remembered that in America it was the high cost of diesel oil that focussed attention on these investigations—and the abundance of lower grade coals will make this development specially suited to a country like India. It is claimed that the adoption of this method of utilising coal will once more make coal supreme as a source of energy and according to some, next to atomic energy possibilities yet unrealised, the gas turbine ranks as the most important power development of the 20th century.

In conclusion it may be said that coal is and will continue to function as an important source of energy for many more years. The chief problem confronting our country is the very limited supplies of good quality and coking coal which, if they are to be utilised efficiently need to be conserved, a proposition which can be

successful only when there is adequate data regarding the physical and chemical qualities of all grades, available. No systematic researches on our fuels have been done so far and the laying of the foundation stone of the National Fuel Research Laboratory at Dhanbad will, let us hope, initiate an era of scientific development of a basic industry. The achievement of independence will remove what little obstruction that may have been blocking progress so far.

FUTURE OF FEDERAL FINANCE IN INDIA

By

Dr. R. N. Poduval

Reader in Economics, University of Madras

The problem of federal finance has been attracting considerable attention during the last decade. The reasons for this are not far to seek. The scale of governmental activity particularly in the socio-economic sphere has been everywhere on the increase. This is manifest in the measures of social security which are adopted or are being adopted in most of the countries. With increasing state activity, there has been an added tendency towards centralization in all Federations. Further, the Second World War and its aftermath by straining the resources of governments has brought about a competition between Federal and State or Provincial governments for revenue. The result has been that the problem of inter-governmental financial relations has come to the forefront. A Royal Commission on Dominion Provincial Relations was appointed in Canada in 1939 and its report was published in 1941. In U.S.A. a Committee on Inter-Governmental Fiscal Relations was appointed in 1943. In Australia, the Commonwealth Grants Commission has been functioning since 1934 and in 1941 a committee was appointed to consider a scheme of uniform income-taxation for the whole Commonwealth. In India, with the attainment of independence and the partition of the country, the proper allocation of resources between the Union Centre and the Provinces has become urgent and a committee under Mr. N. R. Sarkar was appointed to go into the whole question and to make definite recommendations.

In allocating revenues between the Federal Centre and the constituent units, five methods are usually employed. There may, in the first place, be a complete separation of revenues between the two authorities. This scheme vests independent sources of revenue in each layer of government and avoids friction and difficulties of double taxation. The defect of the method is that it is too rigid; in a time of emergency the Federal Government may well find its hands tied. Secondly, both the Federal Government and the component units may have certain independent sources of revenue but in addition both may have concurrent powers of taxation in certain fields, like income-tax and excise. This system has been in operation in U.S.A. and Australia and has led to conflicting jurisdictions. Thirdly, there may be a sharing of revenues between the two layers of government. The revenue may be collected by the Central authority and a portion of the yield assigned to the units. In this system there is simplicity and economy in collection, but there is always the difficulty of evolving a proper basis of distribution. Fourth, there may be subventions

from the Centre to the units and *vice versa.* Central subventions or grants have been developed in Australia and are becoming popular in all Federations in order to effect a national minimum in various services like education, public health, roads, etc. In Australia a Commonwealth Grants Commission was set up in 1933 to deal with special subventions to the states of South Australia, Western Australia and Tasmania. Subventions from the units to the Centre existed in Imperial Germany under the name of Marticular-Beitrage and in India between 1921–22 and 1936-37 under the Meston Award. As Seligman points out [1] 'to have the Federal Government depend entirely upon largesses from the States is to render it more or less impotent and certainly to make it subordinate to the states'. A fifth method of allocation of revenues between the Federation and the units is that developed in the United States recently called the system of credits. With regard to certain taxes like death duties and payroll taxes, the Federal Government in U.S.A. credits the states with a percentage of the amount collected. In U.S.A. both the Federal as well as State authorities levy an estate tax. The Federal Government grants a credit equivalent to 80% of the tax collected to the States which levy a similar estate tax either as a substitute for an inheritance tax or as a supplement to it. This method avoids the difficulties arising out of double taxation and compensates the States for the federal collection of a tax.

The Government of India Act, 1935, followed the method of the separation of revenues with the sharing of the proceeds of certain taxes. It may be well to recall here the provisions of the Government of India Act relating to the distribution of revenues between the Central Government and the Provinces. The Federal Government were given the following sources of revenue by the Act: Customs, Income-tax (other than on agricultural income), corporation tax, salt, railways, excise duty on tobacco and other goods, manufactured in India (except alcoholic liquors and other narcotic drugs and medicinal and toilet preparations containing these things), currency and coinage, posts and telegraph, telephone, wireless and broadcasting, property tax (except on agricultural land), succession duty (except on agricultural land), stamp duties on negotiable instruments like cheques, bills of exchange, letters of credit, insurance policies, etc., terminal taxes on goods and passengers carried by rail, taxes on fares and freights on the railways. The Provincial Governments were assigned the following sources of revenue: land revenue, irrigation, excise duties on alcoholic liquor, opium and other narcotics and drugs, medicinal and other toilet preparations containing alcoholic liquor, taxes on agricultural income, taxes on land, buildings, etc., succession duties on agricultural land, capitation tax, taxes on mineral rights, taxes on trades, professions, callings and employment, taxes on animals

[1] Essays in Taxation, p. 666.

and beasts, cesses on goods entering a local area for sale or consumption, taxes on advertisements and sale of goods, taxes on luxuries, amusements, entertainments, gambling and betting, stamps, registration, taxes on goods and passengers carried on inland waterways, tolls, fees for services rendered.

According to the Act, the following taxes were to be levied and collected by the Federation, but the proceeds would be assigned to the Provinces : succession duty on property other than agricultural land, stamp duty on cheques, bills, etc., terminal taxes on goods and passengers, taxes on freights and fares. Again, the proceeds of the following taxes were to be shared between the Federation and the Provinces: income-tax (other than on agricultural income), salt tax, excise duty on tobacco and other goods manufactured in India except those in the Provincial list, export duty with special reference to jute export duty. But the Federal Authority might not give away any share till its own financial position allows it.

The sharing of income-tax was determined by the Niemeyer Award (1936) by which the Provinces were to receive ultimately 50% of the tax. But, for the first five years from 1937-38 the Central Government in addition to its own share might retain the whole of the Provinces' share or such part of it as would, together with the Railways' contribution to general revenues, bring the Central Government's share to Rs. 13 crores. The conditions created by the war led to an amendment of the Niemeyer Award in February 1940 by which the Centre were to retain from the provincial moiety for the years 1939-42 a sum of Rs. 4½ crores. The same arrangement was continued for 1942-43, 1943-44 and 1944-45. But for this amendment, the first five-year period during which the Centre could retain a part of the provincial share should have ended with 1941-42 and the second five-year period during which the Centre should have reassigned to the provinces the amount retained by the former from the latter's share should have commenced with 1942-43. As a result of the amendment, the second five-year period commenced with 1946-47 for which year the amount to be retained by the Centre from the provincial share was reduced from Rs. 4·50 crores in 1945-46 to Rs. 3·75 crores. The sum to be retained by the Centre during 1947-48 has been fixed at Rs. 3 crores.

The total revenue of the Central Government increased from Rs. 84·52 crores in 1938-39 to Rs. 360·67 crores in 1945-46. This was made possible by the increase in the rates of existing taxes as well as by the imposition of new ones. The rates of corporation tax, income-tax and the surcharge on them and on supertax were raised; excise and import duties were increased. The petrol tax and the postal and telegraphic rates were also increased ; excise duty on matches was doubled. Excess Profits Tax was levied in 1940-41. New excise duties were levied on pneumatic tyres and tubes (1941-42), on tobacco and on vegetable products (1943-44), on betel-nuts, coffee and tea (1944-45). As a result of the taxation

measures introduced during the war period, the tax structure in India underwent a fundamental change. In 1938-39 taxes on income (including corporation tax) represented 22·6% of the total revenues; in 1945-46 they represented 52·5% of total revenues. The Central tax system therefore became more progressive. The yield from Central excise increased from Rs. 8·66 crores in 1938-39 to Rs. 46·36 crores in 1945-46. In course of time this tax may be expected to wrest a place of importance from customs duties.

The Provincial revenues have also been on the increase during the war period. From Rs. 90·83 crores in 1939-40 the revenues of all the Provincial governments put together increased to Rs. 229·33 crores in 1945-46. The increase in revenue is to be attributed to the effects of a number of factors like rise in agricultural prices, increasing utilisation of provincial resources, additional or new taxation imposed and the substantial rise from year to year of the provincial share of income-tax.

The end of the era of buoyant revenues on account of the cessation of the war and of the partition of the country necessitates a reassessment of the revenues of the Central and Provincial governments in India. The division of the country has no doubt weakened each of the Dominions economically as compared to the economic strength of undivided India. So far as the Dominion of India is concerned, partition must of necessity reduce its total revenues. The Pakistan authorities estimated that the Pakistan Provinces were responsible in contributing 7% of the revenues of undivided India. The budget estimate for 1947-48 placed the revenue of undivided India at Rs. 298·42 crores on the basis of existing and new taxes. Deducting 7% of this revenue as the share of the Pakistan Provinces, the revenue of the Dominion of India will be Rs. 277·53 crores for a full year. The first budget of Free India presented by the Finance Minister in November estimated the revenue from August 15th to March 31st, 1948 (7½ months) at Rs. 171·15 crores. For a full year the revenue of the Dominion of India would be roughly Rs. 275 crores. Fuller details will be available only when the budget for 1948-49 is presented.[1]

One may expect that the commitments of the Dominion of India will be considerably reduced as a result of partition since the subventions to the deficit provinces like Sind and North-West Frontier Province need no longer be paid. But in the place of subventions to these two provinces, the Government of India will have to give subventions to East Punjab, West Bengal and Assam. Moreover, partition has only increased the commitments of the Government of India in the shape of the relief and rehabilitation of refugees from the Pakistan provinces. The provisional estimate for this is Rs. 22 crores according to the interim budget presented

[1] According to free India's first full-year budget presented in February 1948, the total revenue of the Dominion of India has been estimated at Rs. 230·52 crores, on the basis of existing taxation.

in November. The defence of the North-West Frontier is now the concern of Pakistan and the Government of India therefore need not subsidise the Frontier tribes. But any economy on defence expenditure on this score will be off-set by the necessity for guarding the Indo-Pakistan borders and by the necessity for building up an up-to-date Navy and Air Force.

The Dominion of India may be expected to be placed in a better position with regard to railway receipts. The railways in Pakistan territory have been the most costly in initial equipment and least productive in profits and the Government of India as a result of partition is relieved of the responsibility of maintaining these deficit railways. But the implementation of the recommendations of the Pay Commission has placed a heavy strain on railway receipts and the result has been that in the railway budget presented to the Dominion Legislature in November no provision for contribution to General Revenue has been made.

Summing up the financial position of the Central Government of the Dominion of India, we may point out that the substantial revenue surpluses anticipated in the Central Budget before partition may now be turned into deficits. Fairly normal conditions can be expected to set in only by 1949-50. In the light of the reduced resources available to the Centre, the Provinces cannot expect increased grants for implementing their development schemes. As the Finance Minister in introducing the interim budget said there is an urgent need for the Provinces to conserve their resources and exercise the most rigid economy in expenditure.

The chief sourcs of central finance will continue to be income-tax, corporation tax, business profits tax and capital gains tax. If the Central Government as well as the Provinces follow a bold policy of economic expansion by carrying out the post-war reconstruction schemes, employment and incomes will increase and the yield of these taxes will also increase. So far as customs revenue is concerned, though the set-back which was sustained during the war has been overcome by the freer flow of imports, one cannot place much reliance on this source of revenue in future. In the first place, the development of domestic industries under the shelter of protection will diminish imports and consequently the yield from import duties. Secondly, in response to international trade agreements, the Government of India will have to make tariff concessions to other countries and this will also react adversely on the yield from customs duties. The Government of India have been levying more export duties recently; but as a result of partition the most important export duty namely the export duty on jute will no longer be available to it. Central excises are becoming increasingly important as providers of revenue. During the war period, they compensated for the fall in customs revenue. As domestic production expands, the yield of these duties may be expected to increase. The commercial services like Railways and Posts and Telegraphs were contributing substantial sums to the

Central Exchequer during the war. In 1938-39 Railway contribution amounted to only Rs. 1·32 crores. In 1945-46 the Railways contributed Rs. 32·00 crores. With the decrease in the volume of traffic due to the cessation of the war, Railway receipts have begun to decline. Expenditure on the other hand has increased on account of the implementation of the Pay Commission proposals, so much so that the contribution to general revenues of Rs. 7½ crores budgeted for in the Budget of undivided India for 1947-48 will not now be made. The income from railways depends to a great extent on the development of the resources of the country and the need for implementing the post-war plan of development is therefore urgent from this standpoint as well. Posts and Telegraphs contributed only an insignificant amount in 1938-39; the contribution being Rs. 0·19 crores. In 1945-46 they contributed Rs. 11·31 crores. The cessation of the war has also reduced postal receipts and the contribution to the central revenues for the nine months from August 15th to March 31st 1938 has been estimated at Rs. 2·03 crores. Contribution from Posts and Telegraphs also depend on the general development of the resources of the country.

A source of income which may be tapped in the future is the profit from nationalized undertakings. There is however a consensus of opinion that at least the key industries must be nationalized. If this is done, it may well bring a welcome addition to the revenue receipts.

The central sources of revenue having been analysed, let us turn to the Provincial field. The recurring complaint of the Provinces has been that while they are charged with the growing nation-building activities, the sources of revenue allotted to them have been inelastic. The burden of land revenue is already oppressive and will have to be reduced. With the enforcement of prohibition, the Provinces will lose one of the productive sources of revenue. Excise contributed Rs. 16·80 crores to the revenues of the Madras Government in 1945–46. It was about a third of the total revenues of the Government of Madras. One can well visualise the big inroad which a policy of province-wide prohibition will make on the revenues of the Madras Government. Dwindling sources of revenue and growing expenditure especially on post-war development schemes have made the Provinces put forth demands for a reallocation of the sources of revenue.

The second report of the Union Powers Committee has followed the Government of India Act in the distribution of the revenues between the Union Centre and the Provinces. The Provincial Governments especially the Government of Madras demanded the appointment of a committee to go into the question of the allocation of revenues between the Centre and the constituent units before the financial provisions are incorporated in the draft constitution of India and it was in deference to the wishes of the Provinces that the Sarkar Committee was appointed.

An equitable allocation of revenues has to reconcile the needs

of a strong Centre with the needs of the Provinces for increased revenue. The trend in all Federations has been in the direction of centralisation of powers and 'unification by finance'. The Canadian committee on Dominion-Provincial Relations recommended that provinces should renounce taxes on personal incomes, taxes on corporations and the various forms of succession duty in return for national adjustment grants from the Dominion Government and the taking over by the Dominion of the deadweight debt of the Provinces. In Australia, the income-tax was centralised from 1942. Income-taxation for the Central Government in all the Federations has become more and more important in view of its elasticity and equity and one cannot conceive of the Federal government withdrawing from this field of taxation. In India, while the Centre should retain this weapon of finance, the Provisional share of the tax may be increased from 50% to 66⅔%. This would meet the claims of the industrially advanced Provinces. There is also the suggestion that the yield of the corporation tax may be included in the Divisible Pool of income-tax so that the share of the Provinces may be increased. In the United States, the States also levy this tax; the States "look on business as a goose which lays the golden eggs and do not care how much cackling takes place in plucking it".[1] The result has been a chaos and complexity of rates as between the different States. The Inter-Governmental Fiscal Relations Committee of the American Treasury has recommended the complete federalisation of this tax and distribution to the lower layers of Government.

Since provincial excise revenue will be rapidly dwindling with the enforcement of the policy of prohibition, it may be worth while to consider whether a share of the Central Excise may not be given to the Provinces. According to the Government of India Act, 1935, the proceeds from the excise duty on tobacco and other goods manufactured in India except those in the Provincial list are to be shared between the Federation and the Provinces, but the Federal Government need not share the tax if its financial position does not justify it. Now that the emergency of war is over and central finances in the not distant future will be put on an even keel, a portion of the tobacco excise may be handed over to the Provinces.

Some of the Provincial Governments have put in a claim for a share in export duty imposed by the Centre on coffee, tea and cotton on lines similar to that given to Bengal in regard to jute. But since import duties cannot be depended upon as formerly as a good revenue producer in view of the policy of protection and of international commitments for the reduction of tariffs, the Central Government has to compensate for the loss of revenue from import duties by means of export duties. In so far as India's competitors also levy similar export duties the Indian producer will not be

[1] Findlay Shirras: Federal Finance in Peace and War, p. 258.

handicapped in international markets. As customs will cease to be a productive source of central revenues, the Provinces cannot hope to get a slice out of it.

The Centre should explore the possibility of levying those taxes the proceeds of which are to be assigned to the Provinces according to the Government of India Act, 1935, namely succession duty on property other than agricultural land, stamp duties on cheques, bills, etc., terminal taxes on goods and passengers and taxes on freights and fares. Death duties are levied in all Federations either by the Central Government or both by the Central Government as well as by the constituent units. The levy of a death duty on the lines of the English Estate Duty appears to be the most suitable to Indian conditions and it is high time that the income-tax in India is supplemented by a death duty. The statement of Sir Walter Layton in 1930 that 'in spite of the widespread poverty in India, there is no reason to doubt that the public revenues of India can be substantially increased without taxation becoming intolerable',[1] still remains true. Death duties as a form of taxation still await the 'sickle of the tax-gatherer' in India.

With the development of trade and industry and more extensive use of cheques, the possibility of a stamp duty on cheques as in other countries may be tried. The cheque-using habit is still in its infancy in India, but with the growth of banking and of literacy among the common people and the use of the regional language in cheques, a more widespread use of cheques can be expected.

The Provincial governments on their part must also explore new sources of revenue. The agricultural income-tax is still not imposed by all the Provinces. A uniform rate of sales taxation in all the Provinces with a view to remove inter-provincial disparities may be initiated. In order to equalize the tax burden, the Provinces can levy in the general scheme of sales taxation higher rates on articles and services consumed by the rich. The Provinces should also adopt a bold programme of expenditure on public works and other services calculated to develop the material and human resources of the Province. With the development of the resources of the Province, the yield from taxes will increase and thus redound to the advantage of the finances of the Provinces themselves.

Some of the Provinces like Madras are experimenting with the nationalization of public utility services. The Madras Government have taken over the Madras Electric Supply Corporation and have embarked on the nationalization of motor transport. Generation and supply of electricity and provision of transport services can and must be undertaken by the State and if they are managed on business lines, they can be expected to yield a profit and thus augment the financial resources of the Province.

[1] Indian Statutory Commission Report, Vol. II, p. 208.

Even with the development of new sources of revenue by the Provinces and the assignment to them of a greater share of income-tax and of a share in excise duties, Central subventions may be necessary for economically backward Provinces with a view to enforce minimum national standards throughout the Federation. The principle followed by the Australian Commonwealth Grants Commission in making grants to the Provinces, namely the measurement of the relative economic and financial position of the Province may well be adopted in India.

Federal finance everywhere is in a state of flux. The war accentuated the tendency towards centralisation in all the Federations. The fundamental problem in all Federations is the reconciliation of the unifying forces brought about by transport, communications and the assumption of more responsibilities by the Federal Government with the desire for greater autonomy on the part of the constituent units. In India, the centrifugal tendencies are on the increase at the present time, but this must not blind us to the fundamental considerations which should determine the choice of revenues for the layers of government, namely the principles of efficiency, suitability and adequacy.[1]

[1] The article was written before the Draft Constitution of the Union of India was published ; the substance of the article, however, is not affected by the publication.

BOOK REVIEWS

Sangita Ratnākara of Sārngadeva.—Translated by Dr. C. Kunhan Raja. Vol. I. Chapter I. Rs. 4.

The Adyar Library Series No. 51.

The Theosophical Publishing House, Adyar, Madras, S. India.

The *Sangita Ratnākara* of Sārngadeva is a work of outstanding importance in the realm of Indian musicology. Its historical value lies in the fact that it was written before the bifurcation of Indian music into the two sub-systems: Karnatic music and Hindusthani music arose. The author was a versatile scholar and his work has been quoted extensively by many writers on Indian Music. Translations of select portions of the *Ratnākara* have appeared off and on. But a complete translation of this important work has been a long-felt desideratum.

Translating a technical work of this kind is not an easy task. It is difficult to find in the English language, equivalents for some of the musical concepts, peculiar to Indian Music. The author has presented a faithful and lucid translation of this great work. When the translations of the other chapters are completed and published, those not familiar with the original in Sanskrit will have ample cause to be thankful.

Attention may be drawn to a few inaccuracies in the book. It is said on p. 8 (bottom) that Ālapti is the presentation of the tune. Ālapti is a species of creative (Manodharma) music and consists in expounding a raga extempore, without any thought of rhythm. (Rūpaka ālapti of course is rhythmical in character). But the word 'tune' implies a piece of music set to time. The terms raga and tune do not connote the same thing. On p. 47, line 13, for the word 'scales' the word 'octave' or 'register' would have been more appropriate.

The explanations offered in many places are useful in understanding the literal translations of the passages. But in a few cases the explanations mislead the reader. As an instance may be pointed out the latter part of para 1 on p. 56. It is well-known that the notes used in Indian music are the acoustically correct notes. There was no necessity for the scale of equal temperament to develop in India, because the musical system herein was developed along pure melodic lines. It is only the scale of just intonation that was and is still being used and will continue to be used. Such statements as the average increase per Sruti between Sa and Ga and between Ga and Pa are misleading. Even in the experiments relating to the Dhruva Vina and Chala Vina the phrase, 'reduction by one sruti' at each of the four stages literally construed, may lead one to the conclusion that the reduction was by equal intervals; but the rider added at each stage—that after the reduction, such and such a string of the chalavina would become equal to such and such a string of the

dhruva vina conclusively proves that the reduction was not by an equal interval at each stage. Again the doubt expressed by the translator concerning the frequencies of notes like Panchama and Antara Gandhara is rather surprising. The Panchama and the Antara Gandhara are respectively the third and the fifth harmonics (Svayambhu svaras) heard on a stretched string and their frequencies are 3/2 and 5/4 respectively. Since the octave sa = 2 and the suddha madhyama is the complementary interval of the Panchama in the octave, it follows that the frequency of the suddha ma is 4/3. (The madhyama is also the inversion of the fifth lower down, from the shadja). The interval between the madhyama and Panchama is a chatussruti (major tone or 9/8). These are universally recognised values and are solid facts.

The explanation contained in the last para on p. 70 would be more easily understood, if the equivalent murchhanas in modern music were given. For example shadja grama is represented by the modern Kharaharapriya. If the nishada of this scale is made Kākali, the resulting murchhana will be Gaurimanohari, the 23rd mela. If the *ga*, of sa grama is made Antara, the resulting murchhana will be Harikambhoji, the 28th mela. When both the *ga* and *ni* of shadja grama are made Antara and Kākali respectively, the resulting murchhana will be Sankarābharana, the 29th mela.

The Svarādhyāya of the *Ratnākara* is the most difficult to translate inasmuch as it deals with many abstruse topics relating to musicology. The translation is on the whole done with care and patience. The readers will await with much interest the subsequent parts of the Translation.

P. SAMBAMOORTHY.

Co-operation. By W. R. S. Satthianadhan and J. C. Ryan. Oxford Pamphlets on Indian Affairs, No. 39. Oxford University Press, pp. 32, As. 6.

The pamphlet under review makes a broad and succinct survey of Co-operation as it has developed and as it exists to-day in India. Beginning with a brief historical sketch the authors go on to describe the organization and working and the purpose they serve of the different types of Co-operative societies, credit and non-credit, existing in this country at the present time. Wherever necessary the latest figures are given to give the reader a clear idea of the dimensions of the movement. But most of the societies dealt with are developments in this province, and it is only incidentally and as a passing reference that developments in the other provinces are mentioned. Strictly speaking the pamphlet should have been entitled 'Co-operation in Madras'. This delimitation of the subject to the Province of Madras was only to be expected from the fact that the authors were closely associated with the co-operative movement of the province for the last few years, the first as the

Registrar and the second as the Joint Registrar and latterly as Registrar of Co-operative Societies. But very little of the inside knowledge of the movement which as its official heads they were specially privileged to have, is revealed. Not one of the problems confronting the movement to-day is discussed or even mentioned. From beginning to end it is just a record of facts and a description of machinery, colourless and commentless. The authors even refrain from speaking of the popular support the movement has evoked or whether the progress registered has been commensurate with the effort expended. They have successfully resisted all temptation to give expression to personal opinion or pass judgment.

Those who wish to know what Co-operation is and how it works in this country will find the pamphlet lucid, informative and in every way a 'Manual' in miniature.

C. W. B. ZACHARIAS.

Indian States and India's Economic Development. Gyan Chand. Indian Council of World Affairs: Oxford University Press. Pp. 30. As. 8.

This pamphlet is obviously meant to explore the possibilities of enlisting the co-operation of the Indian States in schemes of economic development for India. The problem has acquired significance because of the necessity of introducing a planned economy in the country through a co-ordination of its different parts. It is a recognized fact that this process of co-ordination between the States and British India is not an easy task due to the peculiar historical evolution and the political set-up of the country. The economists' task is to devise methods of reconciling the claims of politically independent contiguous areas for the formation of economic regions. Unfortunately Dr. Gyan Chand has devoted far too much of space in discussing the obvious anomaly of the existence of innumerable small states. A little more guidance on economic matters would have been welcome. As it is, except a mention of the T.V.A. as a method of functional regionalism, no light is thrown on the nature of adaptation of the model for India. The States need not necessarily be a liability in an All-India plan. They may have much to contribute if a proper economic machinery is devised for enlisting their co-operation.

R. BALAKRISHNA.

Bretton Woods and After: V. S. Krishna: Indian Council of World Affairs. Oxford University Press. Pp. 36. As. 8.

The establishment of the International Monetary Fund is the culmination of a long endeavour to inaugurate international co-operation in the sphere of foreign trade. The experience of the inter-war period brought about a significant change in the outlook of nations regarding trade and employment. Dr. Krishna has

analysed with extraordinary clarity the events leading to the creation of the new institution. The provisions of the Act have been subjected by the author to a few very constructive criticisms. He rightly points out that in making the quota assigned to each member determine both the contribution to the fund and the amount of overdraft from it, the objective of the scheme has been frustrated to a certain extent. He says that the capacity to contribute gold and the need to borrow are not related and often they move in opposite directions (P. 12). Other ancillary factors contributing to the success of the Monetary Fund have also been examined with great thoroughness within the limited space available for the author. In fine it might be said that it is one of the most useful pamphlets written on the subject. The simplicity of its language and the profundity of its logic are features which cannot escape the attention of even a casual reader.

R. BALAKRISHNA.

The Indian Working Class. By Radhakamal Mukerjee. Hind Kitabs, Publishers, Bombay. pp. 336. Rs. 12-8-0.

This is yet another book of Dr. Radhakamal Mukerjee, that fascinating and prolific writer on economic subjects. He gives here a fairly complete picture of the economic conditions of the Indian Working Class and the problems which await solution. In the 18 chapters into which the book is divided, the various aspects of the subject of industrial labour in India are examined with a thoroughness characteristic of the author. His main thesis that the study of industrial labour conditions has to be made against the agricultural background is set out in the first chapter in the most convincing manner. The two chapters which follow deal with the methods of recruiting labour for the plantations, mines and factory industries. Then two chapters follow relating to the conditions of employment, with a third devoted to the special study of the employment of women and children. Chapters 7, 8, 9, 10, 11 and 12 deal with the wages question, wherein after a careful and detailed examination of the wages paid to different grades of labour in the various industries he makes the bold and uncompromising suggestion of a National Minimum Wage for India. Unlike other writers who have made a similar suggestion, Dr. Mukerjee works out a plan of fixing and virtually implementing the national minimum by stages in the different regions suited to the varying standards of food, clothing, shelter, etc.

In the Chapter on Rationalization and Intensification he points out how in the Textile and Engineering industries the so-called rationalization has really been intensification of labour employment with little increased reward for the heightened productivity of labour. He advocates therefore controlled as against uncontrolled rationalization wherein through prior consultation between capital and labour rationalization measures may be agreed upon.

In his chapter on the Standard of Living a full discussion of the standard of the workers on the basis of income groups and dietic differences is conducted with a fairly full analysis of family budgets. Housing conditions too are examined in exactly the same manner in the different industrial centres of the country.

The chapters on Social Welfare and Security, on Trade Unionism and on Industrial Peace conclude this most illuminating study of labour conditions in India. Under Social Security he advocates schemes of sick insurance, old age pensions and unemployment insurance in all of which the responsibility of the State and the Employer is fully recognised. In the chapter on Trade Unionism the history of the movement in India is traced, the obstacles which prevented early development discussed and the most effective organization and lines of future work briefly indicated. In his concluding chapter on Industrial Peace, after examining the circumstances which caused strikes and disputes in the past, he emphasizes the Works Committee and the Trade Union as machinery for preventing the development of disputes, and periodical joint meetings, the tribunal of arbitration and the Industrial Court for the speedy settlement of disputes once they had started. A useful index brings up the rear.

The book abounds with facts and data collected from all over India with much labour and patience mostly by the author himself and subjected to a most scientific treatment. In the first portion of the work the facts are displayed in such a manner as to speak for themselves, and wherever necessary comparative statistics are resorted to, to bring out most forcibly the deplorable condition of Indian labour. In the second portion definite indications are made of the ideally desirable conditions indispensable for forming a permanent and efficient industrial working class. From beginning to end the book overflows with evidences of the intimate personal acquaintance which the author has with industrial processes and working class conditions. His utterances are therefore authoritative and his suggestions highly valuable.

Laying aside the book the reviewer is tempted to wonder at the untiring industry and the indefatigable energy which have gone into its preparation.

C. W. B. ZACHARIAS.

Supplement to the Madras University Journal

THE PHILOSOPHY OF BOSANQUET

M. C. MATHEW, B.A. (Hons.)

Thesis Approved for the ' Master of Letters'
(M. Litt.) Degree

of the

University of Madras

THE PHILOSOPHY OF BOSANQUET [1]

CHAPTER I

INTRODUCTION

Bernard Bosanquet, born in 1848, was the youngest son of Rev. R. W. Bosanquet of Northumberland. Their family which was of French descent emigrated to England on the Revocation of the Edict of Nantes and in course of time mingled with English and Scottish blood. One of Bernard Bosanquet's elder brothers was Admiral Sir Day H. Bosanquet, another, Robert Holford was F.R.S. and Fellow of St. John's College, Oxford. Charles the eldest brother was one of the founders of the Charity Organisation Society and its first Secretary.

He was educated at Harrow and later at Oxford, where he secured a scholarship in 1867. Green's lectures at Balliol proved to be of great interest to the young scholar. Bosanquet's abilities were soon recognised by Green, for he seems to have remarked about the former that he was the 'best equipped man of his generation'. Another man who exercised great influence on Bosanquet's mind at that time was W. L. Newman, as seen by the frequent reference in his writings to Greek history and thought. Newman's lectures on ancient history and Green's on Philosophy were famous in Oxford in those days.

In 1872 when Green left Oxford his place was taken by Bosanquet and for ten years the latter was Fellow and Tutor in University College. During this time he impressed his students as a man of high learning and elevated ideals. Outside the lecture-room he was equally popular and this could be ascribed to the quality which he imbibed from his master, Green, whose combination of Philosophic and Civic abilities was remarkable. It was during these years that Bosanquet made his life-long friendship with his colleague, F. H. Peters, who like himself was busy with Philosophy. Bosanquet's first publication, a translation of a work by Schomann on 'Athenian Constitutional History', was made at this time of his stay in Oxford and is dated 1878.

Dissatisfaction with the narrowness of college life, of undergraduate teaching in particular, made him leave Oxford in 1881. For some twenty years since then, he was staying in London and in his house at Oxshott within easy reach of the metropolis. Throughout these years, his philosophical position having become almost settled, he wrote a number of books, lectured to various philosophic and other societies and made his contribution to a large number of journals. Thus he led a very busy life like a man

[1] The philosophy of Bosanquet as set forth in the following pages covers only his views on strictly philosophical questions. 'The Philosophical Theory of the State' and his writings on Aesthetics are left out as they can form part of a larger work.

with a distinct mission in life. He was connected with the Charity Organisation Society of which he was chairman for a long time. His interest in this social work was partly due to his brother who was the founder of the Organisation.

In spite of these extra-philosophic activities, Bosanquet never neglected his chief mission viz. Philosophy. His interest in these early years of his philosophical career was in Greek thought especially in the teachings of Plato. It was Plato that made him question the orthodox teachings of his religion. The word 'other world' and the usual talk about compensation in another life, attracted his attention, and he realised that the furtherance of these ideas would tend to neglect of duty in this life. Against this he fought untiringly till the end of his life. About Plato's teachings in this respect, he speaks in one of his last papers. 'Plato, in particular, came as a revelation; not as confirming the dualism of "this" world and "the other", but because, against one's hazy expectation and in opposition to the current and more or less popular legends of his meaning, it was so plain and obvious that his true passion was for the unity of things, and, as guides to its nature, for science and goodness. . . . If his main passion was for the unity of the universe, it was no less a passion for analysing. . . . The two passions coincided in the vision of the universe as that which alone could satisfy the whole intelligence and the total desire. The law of value, as he laid it down for all time, "that which is filled with the more real, is more really filled", together with his doctrine of the increasing concreteness and vital stability of the higher experiences, made an end of dualism in principle, though fragments of dualistic formulae might float in the ocean of his thought, undissolved for the moment.' (*Contemporary British Philosophy*, pp. 54 and 55.)

Kant, Fichte and Hegel were his acknowledged masters though the greatest of them was, as he himself admitted, Plato. The teachings of these German thinkers took a new form in the Philosophies of Green, Nettleship and Bradley. Bosanquet welcomed these British interpretations of German Idealism especially that of Bradley, whose book 'Appearance and Reality', Bosanquet considered as epoch-making. Bradley's first book 'Principles of Logic' covered some controversial ground, and as a criticism of it, Bosanquet wrote in 1884, his first independent work, viz. 'Knowledge and Reality'. Bradley recognised his mistakes later on as evidenced by his later works which marked a modification of his views. This book was followed in 1888 by his 'Logic or the Morphology of knowledge' in two volumes setting forth his full views on logical problems in the light of Bradley's teachings. Between these two dates he wrote his 'Introduction to Hegel's Aesthetic'. His interest in this new field of Philosophy was unique. He wrote again on the subject elaborately in 1892 in his book entitled 'History of Aesthetic', and again much later published 'Three lectures on Aesthetics', a further contribution to the

subject. Aesthetics opened a new field to British Philosophers for the first time, though even to this day the subject remains little developed. One of his most important works appeared in 1899 under the name 'The Philosophical Theory of the State', though in fact it was only an application of Hegelian Idealism to Political Theory as developed in the line of Green's teachings. As might have been expected the book provoked much criticism from schools of thought opposed to his own.

During this period of incessant intellectual activity, it goes to his credit, that Bosanquet never kept aloof from practical life. He was, for example, connected with the founding of the Ethical Society. He also took part in the activities of the University Extension Board. The variety of subjects with which he was engaged during these years can be gathered from his book 'Essays and Addresses' where subjects like 'Two Modern Philanthropists', 'Individual and Social Reform', 'Artistic Handwork in Education', 'The Kingdom of God on Earth', 'How to Read the New Testament', etc., are dealt with.

Bosanquet's interest in religion, already evident from some of the essays in the book mentioned above, made him compile into book form a number of essays entitled 'The Civilisation of Christendom and other studies' in 1893. He also wrote 'What Religion Is' in 1920, a small volume containing his mature views on the subject of religion.

Bosanquet's devotion to Greece and his conviction of the importance of Greek thought for the modern mind remained unabated all these years, in spite of his pre-occupation with other subjects. A book appeared at this time embodying his extension lectures on Plato entitled 'A Companion to Plato's Republic' and was much appreciated by students of Plato. This work was followed by another, viz. 'Psychology of the Moral Self', published in 1897.

From 1900 for some twelve years Bosanquet wrote no books. This is accounted by the fact that he returned to University work in 1903, for, at the suggestion of Haldane he was appointed as Professor of Moral Philosophy in the University of St. Andrews. He held this chair till 1908. It is noteworthy that he commanded great respect from the authorities of the University. By this time he had become a master of the art of lecturing and, over and above this, he was taking a keen interest in the affairs of the University like the conduct of its administration and other University work.

He returned to Oxshott in 1908 and was engaged for some time in preparing a work on metaphysics. On the recommendation of Prof. Pringle-Pattison, Bosanquet was appointed Gifford Lecturer in the University of Edinburgh for the years 1911 and 1912. These lectures, the result of his metaphysical thinking, appeared in two volumes under the titles 'The Principle of Individuality and Value' and 'The Value and Destiny of the Individual'. In spite of his modest claims regarding the originality of the views

embodied in these volumes, they were hailed by the Philosophical world as a unique achievement.

Following these volumes came these smaller works: 'The Distinction between Mind and its objects' (1913), 'Three Lectures on Aesthetics' (1915) 'Social and International Ideals' (1917), 'Some suggestions in Ethics' (1918), 'The Meeting of Extremes in contemporary Philosophy' (1921). Two of the most important of these works are 'Implication and Linear Inference' and 'The meeting of extremes in Contemporary Philosophy'. In the former we get his mature views on Logic, his last word on inference in general. The latter work was the result of his reaction towards Italian Idealism. During the latter years of his life, Bosanquet was constantly in touch with the representatives of Italian neo-idealism like Gentile and Croce. He corresponded with these thinkers for a long time about controversial issues arising from their views and recognised much common ground between neo-idealism and the 'Speculative Philosophy' which he himself was championing.

His last work remained unfinished and was published by his wife after his death, under the title 'Three Chapters on the Nature of Mind'. Bosanquet died in February 1923 at the age of seventy-five. In the *Times* obituary notice he was truly described as having been the central figure in British Philosophy for a whole generation.

It must be mentioned here that he lived a happy, contented life, free from any disasters and serious disappointments. His married life with Helen Dendy, a lady of high attainments and like himself, a great social reformer and writer, was a very happy one. As he himself remarked when one of his friends congratulated him on his marriage, they had every chance of living a happy married life as they 'played the same games'. His letters to his friends show his tolerance of views opposed to those of his own, his modesty, kind-heartedness and many other noble qualities which add to his philosophic genius. During the war he was careful, unlike many others, in not boosting up the virtues of his own country and when peace was concluded he thought that it marked the beginning of an era of incessant work in social reconstruction. He was distrustful of federations and leagues for guarding nations from future wars, and he stuck to the idea that in improvements in one's own station in life, in being a good neighbour, a good citizen, a virtuous man, lay the guarantee for national stability and that the movement to apply this to wider spheres will come of its own accord without any artificial attempts by sets of individuals. He held that a militant state is not a state in the true sense of the term. It is interesting to note that even during the most strenuous days of the war the two leading Philosophers of the time, Bradley and Bosanquet, had nothing to write to one another about except on the nature of Play. This shows a complete faithfulness to one's mission in life in the face of adverse circumstances.

A word must be said about the heritage of Bosanquet. Though from the first the German Idealists Kant, Fichte and Hegel set him on their track, it was to Plato that he owed his greatest allegiance. He was a great Scholar in Greek history, and it was almost thought for some time that this subject would occupy him throughout his life. He believed that the ideas of Plato had much bearing on modern Philosophical problems and that the root of all 'Speculative Philosophy', vaguely termed 'Idealism' and sometimes specified by the term 'Absolutism', lay in the great teachings of Plato. British philosophy was at that time only beginning to learn from the German idealists through the writings of Green, Nettleship, Caird and Bradley. Hegel's ideas were of course the chief source of Bosanquet's inspiration.

During the early years of his philosophical career Bosanquet was mainly concerned with logic and he even thought that Logic covered the whole field of philosophy. 'When I wrote about logic', he tells us in a paper written later, 'I am afraid that I really thought, though I did not loudly proclaim it, that logic was the whole of philosophy. I argued thus with myself. Philosophy is the connected system of the form or ultimate universal essence of all objects, including, of course, all systems of objects. Now about all objects or systems of objects, the pure truth, so far as ascertainable, is to be sought for in the sciences and not elsewhere. Therefore if it were possible to analyse out of the Sciences and exhibit in their connection the universal essence of all objects and their systems, one would have in the result at once a logic and a philosophy' ('Science and Philosophy' in *Proceedings of the Aristotelian Society*, 1914–15, p. 6).

His rebellion against terms like 'pure thought' and 'mere logic' was a result of the study of Lotze. He found valuable suggestions in the latter's logic, though, as he himself said, Lotze did not have the root of the matter in him, that is, 'the clear and unerring perception of the essential unity of thought and reality' (*Bosanquet and his Friends*, edited by J. H. Muirhead, p. 22). It is remarkable that along with Green, Nettleship, Peters, A. C. Bradley and some others, Bosanquet translated Lotze's 'Logic' as well as his 'Metaphysics'. This shows that he regarded Lotze with respect, in spite of his not being deep enough.

From the point of view that philosophy is all logic, Bosanquet gradually changed to the correct view. 'I now seem to see', says the author, referring to himself 'that the common over-sight of all such argumentation is just this: Philosophy no doubt is a theory and its interest is theoretical. But no presumption arises from this that its object-matter is in turn a theory or objects or kinds of being as apprehended through theories. Its object 'prima facie' is the universe with all its activities and values among which the theories of exact science with their objects form only a certain proportion. . . . Besides the theory of what concerns the Sciences, a philosophy which is to have any claim to deal with the universe

is bound 'prima facie' to undertake a theoretical consideration of beauty and goodness. There is no less and no more reason, to start with, for the former than for the two latter. Whether each can maintain itself as a fruitful investigation depends on the course of the investigation itself and cannot in any way be determined beforehand. All of them as branches of Philosophy, are alike theoretical and the demand is rightly to be maintained that their interest should be the pure interest of knowledge. But to suggest that a pure theoretical interest can only apply itself to the investigation of pure theory and its object, is at best it seems to me, a mere verbal confusion' ('Science and Philosophy' in *Proceedings of the Aristotelian Society*, 1914–15, p. 6). His own writings and other activities after this period show that his interest in philosophy became many-sided, an interest showing itself in social, political and other similar problems, in other words, an interest in the universe as a whole.

It must be mentioned here that Bosanquet showed much appreciation of the writings of the new school of realism represented by Alexander and James Ward. Alexander's work 'Space, Time and Deity' made use of the new developments in the physical sciences with which Bosanquet had great sympathy. In his Gifford lectures he pays a great tribute to Alexander for advancing British Philosophy a step further. Though on some important issues there was difference between Alexander's theory and that of Bosanquet, nevertheless, much that is in the former's book coincided with the latter's views.

It is also of interest to know that Bosanquet was in active touch with the philosophy of William James and other pragmatists in America. In Italy there was developing at that time a new school of thought represented by Croce and Gentle. Their neoidealism was a result of the influence of the teachings of Bergson in France. During the latter years of his life, Bosanquet was in constant correspondence with these Italian thinkers and with a knowledge of their language he translated many of their articles in British Journals. He also wrote in Italian his own view-point regarding problems like Time, Change, and Progress and sent them for publication to Italy. Signor Vivnate, Signor Crlini, Camillo Pellizzi were some of the young Italian thinkers of Croce's school of neoidealism with whom Bosanquet corresponded. When Bosanquet died in 1923, an article of his was on its way to Italy. In a note at the end of the Italian Journal 'Giornale' in which this article appeared the Editor announced his death and added the following words. 'We are particularly grieved, seeing that we lose in him a warm friend of our philosophical movement. In England he was ranked with justice amongst the most living and fertile writers in philosophy, to the problems of which even at an advanced age he devoted a youthful activity' *Bosanquet and His Friends*, edited by J. H. Muirhead, (p. 303).

Bosanquet's philosophy cannot be described as idealism, for,

the term is so vague that the individual standpoint which marks him from many types of idealists recedes to the background. You cannot classify an original thinker under lables like 'Idealists', 'Realists' etc. Bosanquet himself would prefer the description 'Speculative Philosophy' to any other. Of course his line of thought is idealistic, but it is an idealism which could absorb many forms of realism. He describes his theory of the Absolute as 'a plain tale, the faith of all resolute and open-minded men'.

By way of introducing the reader to the detailed account of his philosophical views something must be said here regarding the nature of idealism which it was his mission to sponsor. The idealism of Kánt, Fichte, Schelling and Hegel appealed to the author because of its humanising tendency. It once for all dealt a blow to the conception of the 'other world' as taught by orthodox religion. It set philosophy free from the tangle of 'irresoluble antagonisms and antitheses that admitted no movement towards unity' (see Bosanquet's review of 'The Life and Philosophy of Edward Caird', written by Sir Henry Jones and J. H. Muirhead). In idealism 'the spiritual world had taken its place as simply the natural world understood in the fullest light, and within it especially the moral life as the natural life lived at the highest intensity and in the largest enlightenment' ('Essays and Addresses', p. 103). The Dualism between this world and the other world, God and Devil, good and evil, spirit and flesh, the supra-natural and the natural, all these came to an end by the birth of this idealism.

The revolt against religion which marked his early years. declined to a great extent when his philosophical position became mature. (Of course it must be said in fairness to him, that against many of the teachings of orthodox Christianity Bosanquet had his quarrel till the end.) In 'Essays and Addresses' he had written: 'All that we mean by the kingdom of God on earth is the society of human beings who have a common life and are working for a common social good. The Kingdom of God has come on earth in every civilised society where men live and work together, doing their best for the whole society and for mankind. When two or three are gathered together co-operating for a social good, there is the Divine spirit in the midst of them.' (P. 121.) As years passed Bosanquet grew more mild in his criticisms against religion and spoke of the Church as having a place like any other institution intended for the good of human beings. He emphasised the immanence of God in man as against his transcendence. This slow change in Bosanquet's attitude towards religion is clearly seen, if one studies his writings on this subject from time to time. From a down-right condemnation, he seems to have come to a more tolerant and sympathetic attitude towards the teachings of religion. In the fourth essay in his 'Civilisation of Christendom and other Studies', Bosanquet points out how the essential teachings of religion have begun to influence the thought of the generation on lines not easily detectable as having that origin. The

idea of a personal God and a divine creator are behind the comparatively recent conception of an immanent intelligence pervading the whole visible face of the universe and showing itself in the laws of nature. The conceptions of religion, he maintains here, are not to be thrown aside with complacency. The grace of God is really the grace of the universe to the individual. Conversion again, a pet idea of religious enthusiasts, is to be taken as the birth of the spirit brought about by education. Prayer for grace is the openness to all influences which help the spiritual frame of mind, that should have been formed by education, to hold its own. These are the thoughts which Bosanquet expresses in 'Civilisation of Christendom and other studies'. In 'What Religion Is', a small volume written by Bosanquet at the close of his career, he almost defends religion. Religion, he says in this book, has a saving power unmatched by any other type of experience. Religion has its own invade of work. The logician or the Scientist has no business to sphere the religious field. 'Science and logic have their rights; but we must not confuse them with religion. What a man's religion brings him, and what he places himself humbly and sincerely in the attitude of religious faith, let him hold to without scruple. It will be the nearest thing to truth that he can make his own.' (*What Religion Is*, pp. 29–30.) This is a change worth noticing in Bosanquet's attitude to religion.

Reverting to the idealistic philosophy which he sponsored, he held that in this world every one of us has to live fully. In so far as we live it in the best manner possible under the circumstances, we leave our mark on it, our example for others to follow. The best in us is bound to out-live us, if we have a best at all. This is the guarantee for immortality and in no other sense can the conception of immortality hold its ground.

Our finite minds, in so far as they are filled with experience, possess significance far beyond their identification with psycho-physical organisms. Our minds become objective. Our ideas become far wider than personal or psychical events. In this goal of objectivity lies our salvation. The Absolute is the perfect Idea. No psycho-physical organism can ever boast of this achievement, for, the very limitations involved in being psycho-physical prevent us from its realisation. But this is no cause for pessimism. In religious experience, in poetry, in art and in all our deepest experiences we lose our finiteness and become one with the Absolute. This shows our inherent identity with the real and the concrete. In our several stations in life let us do our best. The Absolute is not foreign to us, though its full realisation is beyond us, finite creatures that we are. The effort towards greater coherence in daily conduct and activity, is its own satisfaction. And the thought that by our individual efforts we are nearing the absolute step by step, must be our solace and guiding inspiration.

In the chapters that follow a detailed analysis of the theory of the Absolute as sponsored by Bosanquet, is attempted.

CHAPTER II

THE FINITE INDIVIDUAL AND HIS DEVELOPMENT

Man appears on the face of the earth with certain definite qualities. These qualities which distinguish him from the lower animals are the result of age-long efforts on the part of the whole system of things to evolve a relatively satisfactory individual. Material arrangements reach a stage here, when, nothing short of consciousness will suffice. From the level of mere trial and error, whereby reaction to surroundings is effected by the lower animals, the human being ascends to the level of conscious direction. He brings into play his exclusive capacity to mould his surroundings according as he wants them to be, so that his well-being is now a degree more secure. By means of institutions which he builds up he develops a social consciousness and an objective mind without which progress cannot be imagined. His contribution to the growth and the spread of civilisation is to be left to the verdict of posterity which alone would possess a larger vision necessary for making such judgements. Therein lies his immortality also. He will be remembered through the ages not by his proper name but rather through the concrete achievements that stand to his credit. This is the story of every man who appears on the earth.

From primeval matter develop life-forms. Movement and behaviour become, so to say, intelligent in the case of the latter. In the behaviour of matter though there are variations within a whole and exemplifying a law or principle, the variations themselves are 'blind'. The laws of nature which our minds discover, are all laws in a special sense. Material things do not behave intelligently like living creatures, which behave according to set purposes. Nevertheless the fact that nature never repeats itself and that every law which we unveil from out of its many manifestations is a coherent 'whole' within which the differences or the individual manifestations all have a place and a function, indicate that even at this lowest stage there is present, though latent, that 'nisus' to individuality which on the human level is so marked a characteristic. In a simple law like, say, 'Action and reaction are equal and opposite', the manifestations are seen everywhere. But in no two instances is it repeated in the same fashion. The variations in the way a law is exhibited show that each of these variations has a definite place in the law, which is no more a mere statement of a common quality, but a coherent 'whole' enveloping a wealth of content. It is this 'meaning' in even the minutest variation or behaviour of brute matter, that sets us thinking about the continuous principle of individuality and coherence spread out over the whole system of things though certainly in greater and greater degrees in the higher stages of evolution.

In living creatures behaviour, as was said above, takes a new shape. It becomes intelligent though, of course, conscious direction cannot be found except on the human level. Even among plants a vague tendency for preference and even an exercise of control over the circumstances are to be found as, for example, when a creeper meets a thorny tree and finding its growth obstructed, turns to another tree suitable for its healthy growth. Experiments on the lowest as well as on the highest living creatures have revealed the truth that conscious direction and control are latent throughout all forms of life. This implicit presence of purposiveness becomes explicit by degrees depending of course on the organisation of structure. This organisation of structure is effected by natural selection. The conditions which the universe brings to bear on a structure or an organism in shaping and modifying it are many and will certainly include in the case of living creatures those which are their own making. In logical terms we may call the principle at work, the principle of non-contradiction. Whatever is superfluous and obstructive, is thrown out by the organism through, of course, a necessarily long process of adjustment to new conditions indicated by expressions like 'survival of the fittest', 'greatest happiness of the greatest number' etc. The structure of the human body is a highly organised one and is the result of such a long process of natural selection. As a result of this development mere sentience is replaced by explicit consciousness. In explaining the consciousness we find in human beings, what deserves to be stressed is that it is really a focussing of external things until they reveal their internal life in a way to be envied even by the higher animals in which consciousness exists only in a latent form. Man can consciously recall incidents, introspect, indulge in imaginary luxuries, in short, live an intellectual life. None of these things is within the power of even the higher animals. From the day the individual is born into the world until he becomes mature, there is a continuous effort towards developing what is called 'individuality'. Of course, this necessarily continues till he dies. But until he becomes an individual with a mature mind, we cannot fully judge his actions or study the value and the destiny of his life.

Of a developed human being it might be asked 'what is the relationship between his bodily structure and the quality of mind which is attached to it? It is alleged by some schools of thought that mind is an independent source of energy unaccounted for in the bodily balance-sheet. The Interactionist hypothesis, for example, affirms that mind is a fountain of undifferentiated spiritual energy. It can dictate to the body whatever is desired by it, so that it is almost the sovereign power exercising unlimited control over our actions. For the interactionist, body and mind are two separate entities. There is nothing to control the unlimited power of the mind.

An hypothesis like this cannot be strictly disproved, though its

absurdity can be pointed out by reference to specific instances of mental and physical activities. In an instance like, a man dying of starvation, can death be delayed through a supply of energy having a psychical source? Our conceptions of nutrition and bodily nourishment all conflict with the Interactionist contention. The interactionist posits that the two entities mind and body are separate. Now this is a false abstraction because nowhere in life can we find a purely mental or a purely physical activity. The two are dependent on each other. Constancy of energy cannot of course be proved as an absolutely precise generalisation. But this is because bodily factors and mental factors cannot be isolated from one another and subjected to experiment. Constancy of energy has to be taken as true because all our ordinary ideas and working assumptions as to the conditions of human life, show that there is a mechanical limit and control in even our highest teleological activities. If, for example, we dissociate will-power from the concrete content on which alone it works, how unintelligible would our moral conduct become! 'In every purposive adjustment', says Bosanquet, 'there is on our hands the fact of a physical system in reaction with an immense store of pre-adaptations by all of which the new reaction must presumably be influenced' (Principle of Individuality and Value, p. 185). In every new purposive adjustment there is involved a modification in the bodily factors and the whole system of the individual. A new situation evokes a new reaction from the individual on the basis of his old self.

The relation between body and mind (or mechanism and teleology) is clearly dealt with by Bradley in his 'Appearance and Reality' and a reference to that would not be out of place here. In the Chapter entitled 'Body and Soul', he, like Bosanquet, points out that there is nothing like a bare bodily state or a bare mental state. Body and mind form one totality, one system. Their relationship is a leading instance of the true nature of individuality. Body which is a part of the physical world, is only an arrangement possessing temporal continuity and a certain amount of identity in quality. We take it as independent for certain purposes. But this is only a working point of view. The soul or the mind again is no more self-subsistent than the body. It is a finite centre of immediate experience possessed of certain temporal continuity and of certain identity in character. For him these two finite entities, the body and the mind, are always casually related. The one, it must be remembered, does not influence the other when bare, for, there is nothing like a bare soul or a bare body. Only for convenient sake we pick out a prominent aspect and call it a bodily state or a mental state as the case may be. Normally every event has two sides. The two sides mental and physical taken together are the inseparable cause of the event which succeeds. The Sciences of Psychology and Physiology each deals only with one aspect of this double event.

Bosanquet and Bradley are both of opinion that mind is the result of certain material arrangements. They are for a physical origin of the Soul. But Bradley's warning in the same breath deserves notice. The human personality is the result of a slow process of evolution. The soul does not emerge all at once in the body. Its emergence can be viewed as caused by bodily factors only, if we, under a license, posit body as an abstraction not involving any mental factors at all. But this is never the case. Bodily and mental factors are inextricably connected in all our activities and from the beginning of our lives. Hence we can say that matter is the cause of mind only if this abstraction is kept in mind.

The function of mind, Bosanquet says, is to provide the bodily organism with a broader vision of things so that its development is made easier. Unlike the lower animals man can create an environment for himself by the power of his consciousness. 'Here, in the case of Mind, we come to true contrivance; the forecast of a situation and the combination of means to meet it. But yet here, as in the last case (in the case of the lower animals)—the court of ultimate appeal is natural selection or the verdict of the environment' (*Value and Destiny of the Individual*, p. 88). The question has to be met here as in the case of the evolution of the lower animals, 'Will the Universe stand your experiment or will it not?'.

If material factors control mind, as was stated above, how can mind in its turn exercise any power over these material factors? Is this not an obvious contradiction? The answer is that it is a double-sided activity. Mind and body co-operate with one another. The predominance of one over the other depends on the instance in question. Bosanquet cannot be indicted as a crude materialist. He, no doubt, points out that the 'material factors' alone have the final say in evolution. The question 'Will the Universe stand your experiment or will it not?' has to be faced at one time or other. But it must be remembered that the 'Universe' understood correctly does not mean the chaotic material universe of a by-gone age. The brick-bat notion of matter and the crude materialism resulting from such a conception have no place in Bosanquet's philosophy. In fact he opposes it wherever he can. An immanent teleology, he always pointed out, pervades the visible face of the universe. The laws of nature are not the chance behaviour of particles of matter. Remembering these points, Bosanquet's contention that material factors control mind and that the verdict of the environment is what affects the course of evolution, does not give room for any materialistic interpretation.

Man is only a phase in the evolutionary process. He is through and through controlled by the environment. His mind itself is a result of the work of the environment. Mind emerges and the work of the environment begins on a new plane. The guidance of mind is a guidance by the new light which breaks upon the individual. He has now a greater union with the environment,

a greater power of consciously working out its designs. His position is henceforward unique.

What is to be noted with regard to the individual is that he thus becomes a finite–infinite creature. His finiteness is brought out in pointing out that he is only a phase in the evolution of the universe, a vehicle in the hands of the Absolute. He is through and through limited and controlled by his surroundings. His infiniteness lies in the quality of transcendence which he exhibits in every act of his, the power to mould circumstance to a certain extent and, above all, the power to realise that the highest in him is one with the whole system of things so that by his efforts towards progress and self-transcendence he is only exhibiting his true nature.

The finite individual has always a tendency to regard himself as an exclusive personality independent of the world around him. It is a dangerous thing to assert that individuality consists in our formal exclusiveness. Statements like 'When the self is most itself it is most alone', 'to realise our individuality is to absorb ourselves in our exclusiveness' indicate this line of thought. Of course, in one's emotions and feelings, one is confined to a certain extent within oneself. But this is the least in him. It is the concrete content of his mind that is all-important. Even in our elementary feelings there is present that self-transcendence which is the mark of all our highest possessions. In feeling, for example, it is its content rather than its form which reduced to mere 'form' vanishes into nothing, which gives a concrete shape and life to it. In our highest experiences like religion and poetry, this self-transcendence is complete. We lose all our formal independence and become one with the whole reality.

Of course there is formal distinctness between one individual and another. But nothing prevents an identity of content prevailing among individuals. The self-transcendent nature of the soul guarantees it. Our civilisation, our social institutions, our religion, our art and all our highest achievements show that the identity in the contents of particular finite minds is the real influence at work.

The finite individual often puts himself in a position that is detrimental to the healthy development of his self-transcendent nature. He builds around himself a world of claims and counter-claims, demanding from the world all that is advantageous to his life. He makes himself absolute and demands justice from his fellow beings and when the world refuses to satisfy his demands, he makes an artificial resort by invoking a God, whom he considers as his creator and who will dispense justice to him in another world. Even in his conception of the creator, he brings in the idea of his absoluteness and his demands on his creator meet with the same result. He lands himself in an attitude of pessimism which looks down upon life on this earth. The fact of the innocent suffering gives him a further ground for condemning the world. The innocent sufferer, he argues, will get his

reward only in a future life. This is the realm of individualist ethics. 'We remain, so far as it goes, in the world of claims and counter-claims, with the supreme ruler out of reach above us, and our fellow finite beings of mind and nature at arm's length around us. We get no nearer to the one, and no closer to the others.' (*Value and Destiny of the Individual*, p. 140.)

But this is not the truth about us. If we obey the call of our highest nature we cannot but admit our continuity with the world around us. All that we value lies outside us. In fact our selves possess any significance only in so far as they make their own what is outside them. We are only custodians of a treasure compared to which we as selves are relative and unimportant. When we realise this truth and view the universe from a spiritual basis, '——all sufferings of any member we see at once must in principle be borne by all; and, owing to the nature of the power to endure, will continually be borne in chief measure by "the best"—the completest, most capable, least obviously guilty members of the whole' (*Value and Destiny of the Individual*, p. 148). The innocent man's suffering need not make us condemn the world in any special sense because the fact remains that he is more fitted to endure suffering than the less fitted disorganised members of his community.

The question arises at this juncture whether such a society can be built up by us, finite creatures that we are. Is it not inevitable that a finite society in space and time actually falls short of this ideal? It is the recognition of this inability on our part to build a spiritual world that justifies the existence of the State which, with its judicial machinery, apportions justice to the deserving. Of course, the state with its judicial machinery need not exist in a perfect world. A future world, if it is going to be an advance on the present, will make such artificial arrangements for continually reminding the individual that law and order should be aimed at by every one, less and less necessary.

The hazards and hardships which every individual has to bear in greater or less degree, have to be understood from the proper perspective. We must remember that this world is a 'vale of soul-making' and that our rebuffs and frictions do us good because they shape our personality. None of us can foresee what amount of hardship lies in store. If this had been the case we would have evaded the most dreaded moments of our lives and thus deprived ourselves of the value which they would have bestowed on us. Pleasure and pain are two broad divisions into which we can class all our hazards and hardships. No activity of ours is free from their tinge. There is, of course, nothing like pure pleasure or pure pain. When an activity is obstructed, pain is produced and when it is successful, there is pleasure. A pleasurable activity is pleasurable only in comparison to a less pleasurable activity. Both pleasure and pain enter all our activities. In the creative activity of a poet in writing a poem, for example, we cannot say

what exactly his state of mind is. There is present a mixture of pleasure and pain with, of course, a predominance of the former at the culimination of his activity.

Pain is the stimulus for better adjustment. Pain and conflict cannot be removed from our lives. The argument in support of a painless and evilless future is based on the hard opposition between pain and pleasure, good and evil. Pain cannot be quantitatively submerged under a balance of pleasure. They are not plus and minus quantities. They are related to one another and both are stimuli to the achievement of more and more harmonious experiences. The future will not abolish pain and suffering. What seems plausible concerning a future which will see a better society than the one existing now, is that it is not an abolition of the finite—infinite conflict that will happen, but rather its more conscious realisation. There will certainly be less of brute agony and suffering as society progresses and finite self-conscious beings gain mastery over themselves and nature. Instead of physical sufferings and pleasures of the senses, there will be spiritual conflicts and triumphs. Man will have to wrestle with deeper problems.

Pain and suffering are therefore inevitable incidents of finite self-hood. It is in seeing their ground, that is, their value to the individual that the attitude we take to life, depends. In significant contradictions as represented by the extreme of mental and bodily suffering, we are remoulded on a sound basis. If the finite—infinite being survives such dead-locks then the union or reconciliation which overcomes them is universal and substantial. Whatever is discrepant and contradictory is thereby ruled out from his personality. The individual thus enters a new life altogether. Even physical death will become necessary sometimes. A man who sacrifices himself for a cause, offers his physical body as a price, and the courage and resoluteness implied in such an act, reveals a grasp of reality with which he will be in greater union after his death.

It is wrong in principle to indulge in sentimental exaggerations of suffering and pain in this world, and say that the world has gone to the dogs. When we go to the facts of suffering as such, we see the falsity of such sentimentalism. Suffering and pain are necessary for finite life, for, without them progress and movement cannot be imagined.

The finite individual should not therefore fight shy of this world with all its hazards and hardships. He must live a life co-operating fully with the rest of reality, with his fellow-beings and with the world, all alike exhibiting that forward movement which is in line with his own nature. His institutions, his social life and all that he makes in co-operation with others, help to develop his personality. He must cultivate that religious consciousness by which he comes into direct contact with the totality of things, which is the spirit of every form of popular religion. The form in

which popular religion arrays itself is in many respects objectionable. Its beliefs in a personal creator, in personal immortality, etc. are examples. What is important is the underlying recognition that we can by the aid of the religious consciousness realise oneness with the Absolute in certain moments of our lives. If the expression 'religious consciousness' is misleading we may as well substitute 'Aesthetic enjoyment' or 'Poetic experience', or 'artistic experience'. In these rare moments we realise that the highest in us is a most precious thing, is, in fact, the whole reality, that in every day life we think of as external to us. It is this recognition that supplies us with a deeper optimism that knows nothing of the superficial pessimism implied in the standpoint of individualist ethics.

It might be relevantly asked at this juncture 'what happens to the individual self when its body perishes?' Are we to posit an immortality whereby we continue just as on this earth, in another place? If we subject our desires for immortality to a critical examination we find that it is not our exclusive personality that is desired in a future life but its concrete content, all that we value as constituting its true nature. We cannot consistently desire that our finite selves should continue in a future life with all its finite relationships. The best in us must outlive us. And it will outlive us. The achievement of our highest desires will come about in course of time. Others will finish the work which we have begun. The question of the particular finite self, indicated by the proper name, that actually finishes the task is unimportant. All of us are immortal in the sense that our real contribution to the world, if we make one at all, will outlive us and will be ultimately fulfilled in the Absolute. This is the comforting thought that brings security to our lives.

The finite individual has, therefore, nothing to fear about the half-finished work he is forced to terminate by his death. All he has to do is to put forth his efforts to the extent that his lifetime would permit him. By his conduct and by his intellectual activities, let him try to realise himself as much as possible. Let him do justice to his finite—infinite nature. Then everything else would be right.

The finite self possesses individuality not in its own right. As a finite self it is transient and discrepant through and through. 'It is a substance and an ultimate subject, but not in its own right. Its existence, as an existence, bears the unmistakable stamp of the fragmentary and the provisional.———But through all this, and operative in it, there shines the intentional unity. It is not my monad nor my star. It is the life which lives in me, but it is more of that life than I succeed in living. I am substantive and subject, then, but only so far as I recognise myself to be adjective and predicate'. (*Science and Philosophy*, p. 104).

Regarding the question of the mode of being of the finite individual, the question whether this mode of being is substantial

or whether it is only adjectival, the position of Prof. Pringle-Pattison, as set forth in his Gifford lectures entitled 'The Idea of God in the light of recent Philosophy', deserves mention. He directs his attack on Bosanquet's position, as stated above, and points out that individual souls are not mere adjectives of the Absolute. The individual, he says, qualifies and characterises by its existence and character the nature of the whole to which it belongs. The whole in its turn depends on the parts in that its nature would have been different if an individual, for example, did not exist or if its character were other than it actually is. Admitting this, can we say, asks Prof. Pringle-Pattison, that the provisional subjects in question are 'best considered as characters predicable of the universe. Is this not going from the relation of whole and part to the specific and quite different category of substance and accident, thing and quality in the traditional and ordinary sense of these terms? In his 'Logic' Bosanquet has definitely stated that all 'finite individuals are in ultimate analysis connections of content within the real individual to which they belong'. For Bosanquet, the true form of predication is not 'S is P' but 'Reality is such that at or in S it is P'. Prof. Pringle-Pattison says, referring to this, that the words 'at or in' are an inconsistent concession to the ordinary view which substantiates S. Bradley also makes the same mistake, says Pringle-Pattison, as for him too Reality is such that S implies or is accompanied by P. These propositions are synonymous with the proposition 'If S, then P'. We are thus left with hypothetical judgements whose one ultimate subject is Reality. 'But surely', the critic says, 'this indiscriminate and unmediated reference to Reality is as unnatural as, for example, Berkeley's attempt to resolve all the things and happenings of the external world into the immediate acts of God. And——it ignores entirely the concrete texture of existence as distinguished from the abstractions of the intellect" (*Aristotelian Society Proceedings*, 1917–18, p. 510). Reality at every point is a 'this' and a 'what'. The word 'substance' can be applied to each such bit of reality, to wholes as well as parts of wholes. Sentient beings possess substantive individuality in a still higher sense. "The higher we go, the more clearly does individuation impress itself upon us as the very method of creation, or, to speak less theologically, as the central and most characteristic feature of the cosmic evolution" (*Ibid.*, p. 511). Bosanquet speaks of the concrete content of individual minds apart from which they cannot be conceived of. But is not the content itself an abstraction apart from the finite centres of experience? "Prof. Bosanquet appears, however, to think of content as a self-existent continuum and of the conditions of individual existence as comparable to partitions introduced into this continuum (as we might let down vessels of different shape into a stream) by which one section or area is temporarily enclosed and, to its own misfortune, isolated from the rest" (*Ibid.*, p. 512). Finite

selves are not really transmutable into the Absolute. They are unique centres of experience. Blending them into the Absolute, is virtually putting out the lights one by one and ushering in total darkness. Our moral conduct, our volitions, are all actions for which we are responsible. They cannot be taken, as Bosanquet does, as merely the universe acting on me. We cannot make the world process a mere make-believe. In his chapter on the 'Moulding of Souls', Prof. Pringle-Pattison points out, 'Bosanquet actually admits that this process is one of 'eliciting our own souls from their outsides', though it is pointed out later on, in the same chapter that the word 'elicit', covers an almost miraculous creation which it does not explain'. For Pringle-Pattison this miracle is an ultimate fact. To the question put by Bosanquet, 'Is the supreme end of the Absolute to give rise to beings such as I experience myself to be?', Prof. Pringle-Pattison answers that it is not I in all my imperfections which is the end of the Absolute but '— it is the spirit as God knows it and intends it to become, the spirit with its infinite potentialities and aspirations and the consciousness of its own imperfections, which is the fulcrum of its advance and the guarantee of a nobler future'. (*Ibid.*, p. 524).

In considering these arguments directed against the adjectival mode of being of finite individuals as contended by Bosanquet, it must be pointed out, that in no sense can finite selves be taken as ultimate subjects. Do finite individuals, for example, include within them such subjects as civilisation, society, nature etc? Is it not more reasonable to conceive of a gradation of subjects progressively nearer to being ultimate up to the universe? Of course, we can and we must to a certain extent, in view of practical convenience and specific reference, consider things and selves as provisional subjects capable of being picked up and described as unitary subjects. But the abstraction involved here must be kept in mind. Both Prof. Pringle-Pattison and Bosanquet reject the old doctrine of soul-substance as a kind of metaphysical atom. Individual souls are not isolated entities. Both their existence and their nature are derived. If we could possess ourselves entirely says Pringle-Pattison 'we should be—either the Absolute in Propria Persona or Browning's' 'finite clod untroubled by a spark' (*Idea of God*, p. 260). But Pringle-Pattison admits only inter-relation among individuals and not *subordination*. Bosanquet's position is the latter one. For him membership in a 'whole' means progressive nearness to this 'whole'. It is an error of all popular theories, especially of religion, to conceive of individuals as self-complete and independent and repeating side by side as members with equal status and independence. We often think of a subject existing both before its lifetime on earth as well as after it. But all this is the old fallacy of forgetting the abstraction which sets up finite individuals as self-existent subjects. There is, of course, all of us feel, a unity in our selves from which

all our aspirations and efforts proceed. But we fall short of it in our every day activity and thought. If we possess this unity in our thought and action, we will not be ourselves any more. We will become one with the ultimate and the perfect. Herein, we must recognise, lies our substantive reality. We are not ultimate in our own right. In error and in sin we think so. 'There is, then, just this much truth in me, that I am here upon the stage, thus much, and no more.' (*Aristotelian Society Proceedings*, 1917-18, p. 497).

The finite individual therefore derives all his content from the not-self which he makes his own. His freedom, and initiative lie only in the capacity which the quality of consciousness, the focus of his content, possesses in moulding and changing the environment in which he lives. It is wrong to think, for example, that in the great experiences like love, social morality and religion our selves are distinct from other selves not capable of them. These other selves have their own contribution to these experiences which we alone could enjoy. We cannot love or hate as we wish. These experiences are rooted in the not-self which alone makes the self what it is.

But all the same, Bosanquet is careful in pointing out, we are not *mere* adjectives in the sense that P is an adjective of S in the proposition 'S is P' taken in that sense. We enrich the universe. We supply it with its life and energy. The conclusion to be therefore drawn, is, that our existence as a substance or thing is of no value unless understood as an aspect of the universe, the real unity of which lies outside us.

No one individual is exactly like another. Each has his distinct mission so that all form parts in a whole. 'They would look like bits of machines or organs of organisms fragmentary and incomprehensible till the whole were supplied to which they respectively belonged, each with its driving-bands or nerves or wireless aerials hanging loose around it, all senseless and self-contradictory apart from the inclusive structural system'. (*Science and Philosophy*, p. 95). In our separate missions and while we carry them out separately,— 'the Absolute lives in us a little and for a little time. When its life demands our existence no longer, we yet blend with it as the pervading features or characters which we were needed for a passing moment to emphasise and in which our reality enriches the universe'. (*Science and Philosophy*, p. 112.).

CHAPTER III

TRUTH

The term 'Truth' is synonymous with the term 'knowledge' understood as the mind's achievement in understanding the world. This latter, to be worthy of its name, presupposes that the mind must put forth its 'best'. Whether in the sphere of practice as, for example, in organising a movement for promoting good-will among nations or in the sphere of theory, say, as in understanding the Theory of Relativity, the scrutinising abilities of the mind, its power to correlate relevant materials, its hold on the essentials etc., have their play. Theory and practice are the two main activities of the mind. They involve one another and often help one another. A purely theoretical concern may have great practical consequences. These practical consequences may in turn help the former to assume a new life and concreteness. In an attempt to explain the nature of 'truth', the province of 'theory' must be approached first. Only our theoretical concerns could be called the seeking after truth. The nature of truth is the nature of knowledge-forms. A correct approach to a subject or a problem, of course, requires that certain preliminary psychical and physical conditions be satisfied. But this is not the concern of the student of truth. Assuming a normal adult mind, he investigates the principles underlying the various departments of knowledge. How does mind proceed in these various spheres of its activity? Do they not exemplify certain common forms of mental processes? Of course, this is not a study of the mind and its laws understood in any psychological sense. The psychologist studies the mind and its workings in isolation. The knowledge-forms which logic investigates are not mental laws of individuals but the result of the combined working of Mind and Reality in the efforts of the former to understand the latter.

The study of knowledge-forms must begin with the study of judgements, that is, our assertions about reality. Judgement is the lowest limit in the gradation of knowledge. Our Sciences and other departments of knowledge abound with judgements. What are the forms which these judgements take prescribed by the necessity imposed by the real? From the lowest to the highest, judgements form one continuous line. The lower type of judgement merges into the higher. The tracing of this continuous development is the morphology of knowledge.

The first step in knowledge is the act of naming. In naming an object, there is involved the grasping of some positive content marking off that object as also its distinction from other objects. The rudiments of judgement are present here. The child attributes some positive qualities to its mother like giving milk, seeing to its needs etc., and does not consider her as merely different from other persons and objects.

Even in this rudimentary stage where qualities are hazily grasped, there is present that 'identity in difference' which is the hall-mark of all judgement.

It must be noted here that the central function of the intellect is one from beginning to end. It is wrong to think, as Lotze does, that first we have impressions, then we proceed to ideas and finally to judgements. This is a mechanical description of the life of mind. A judgement is not a combination of ideas or concepts. It is better described as an idea or impressions writ large rather than as a combination in which ideas or impressions are units. Even in the simplest ideas, there are present the rudiments of judgement. An impression or an idea entertained in a mind, however hazily, is an act of that mind and, as such, an act of judgement. Mind is not a mere recipient of impressions. It receives them partly because it cannot help it, owing to the impinging character of reality, and mostly because, by its purposive nature, it actively seeks them. A normal mind is purposive in all its acts. Hence by entertaining an impression or an idea it commits itself to an act of judgement.

Do interjections and other forms of questions, wherein nothing is definitely affirmed, form judgements? A question like 'The battle-lost or won?', is not a judgement because no definite meaning is implied in it. Such indefinite assertions are referred to reality as true under unknown conditions. Nevertheless they exhibit an imperfect disjunction. In true disjunction the conditions of the alternatives are determinate. Here, over and above the indeterminateness of conditions, there is also total absence of any definite affirmation.

In an act of judgement, we assert something about reality. Most often reality comes to us in bits. The qualification that we attach to a bit of reality, is ideal not in the sense that it is a mere psychical existent but in the sense that a meaning is affirmed of that bit. The idea tyrannises over the image. It bears universal significance. In a perceptive judgement like 'This tree is green', we have, for example, the idea 'green' referred to a bit of reality, viz., 'this tree'. The propositional form of the judgement reveals three distinct parts, viz., the subject, the predicate and the copula. The subject indicates our contact with reality, the predicate the meaning we attach to it and the copula the sign by which the predicate is asserted of the subject.

Does a judgement as it actually take places in the mind consist of these three parts? Is there first, a bit of reality presented before our minds and then an affirmation about it? In other words, is judgement in time?

The answer to these questions is that in judgement there is no time element. We do not first see an object and then judge a quality about it. In the very seeing itself, there is judgement. As Bosanquet says, 'In the first place consciousness refuses to abstain from judging whenever it is presented with a content and secondly

what comes first would not have the significance of a subject unless with reference to something already referred to it in the way of predication ' (*Logic*, Vol. I, p. 186). In judgement what happens is not first an S (subject) and then a P (predicate) affirmed of the S, but an s-py becoming S–P when the perception becomes clear (by standing for the superfluous and irrelevant elements which are eliminated in the final judgement).

Again a judgement is an identity in difference or in other words, is both synthetic and analytic. The qualification which we attach to a bit of reality brings in a new difference in the identity. The 'tree' which is grasped synthetically is analysed into one of its many qualities, viz., greenness. We cannot analyse a thing unless we have this synthetic grasp. The analysis in its turn adds to the synthesis of the 'whole', viz., tree. We cannot analyse a thing unless we have synthetically grasped it as a 'whole,' nor can we synthetically grasp it without some analytical knowledge about it. Analysis and synthesis go hand in hand.

Interjectional and impersonal judgements occupy the first stage in the judgement—process, e.g., 'How hot!'. Here the subject is not specifically stated. Again the quality affirmed is not fully analysed. In judgements of this kind we see the indistinguishability of the subject and predicate in a clear light. We get a direct glimpse of the truth that reality is both inside and outside consciousness.

These rudimentary qualitative judgements develop to a higher phase in the demonstrative judgements, e.g., 'This is hot!' There is present here an indication of the subject, though this indication is not specified as in 'This metal is hot'. In demonstrative judgements the subject is a mere 'this' or 'that', a mere 'here' or 'there'. Here we perceive rudiments of space and time, which in comparative judgements, a later phase, are definitely implied. A judgement beginning with the word 'then' suggests a 'now' and implies the universality of time.

In comparative judgements like 'This is redder than that', 'Here it is hotter than there', the 'this' becomes a part 'not that' within 'this and that', and the 'here' becomes a part 'not there' within 'here and there'. These judgements, moreover, exhibit the beginnings of quantity by introducing the idea of 'more and less'. The recognition of difference in identity becomes one degree more explicit in a further type of judgement like 'This (e.g. This green paper—implicit, if made explicit the judgement belongs to a higher kind) is lighter here (in this part of it) than there (in that)'. There comes in a standard with reference to which comparison is made.

From pure qualitative judgements, as in the recognition of difference in two sounds, we proceed to a definite measurement of the pitches expressible in quantitative symbols. We say 'This piece of wood is ten feet, six inches' measuring it according to a standard scale. In ratios and proportions precise measurements

take a new shape. A judgement of proportion has both individuality or morphological unity through characteristic ratio which is the same thing as proportion, and relativity or necessity by the reference of the units in which the measurement is expressed to a standard outside the individual 'whole'. In all judgements these qualities of individuality and relativity are to a certain extent present. The ultimate subject of every judgement is the whole of reality by the relations which it has in all directions. There is also present a morphological unity, by the aid of which only, we are able to concentrate on the subject of the judgement as a specific individual.

The question of 'relativity' carries us to a side-development in the judgement—process. This is the hypothetical judgement. The judgement 'A is B' becomes 'If A is, then B is'. The concreteness of the subject is to a certain extent sacrificed here. The categorical and hypothetical aspects are, of course, present in all judgements. Even judgements beginning with proper names where, apparently, determinateness of content dominates over necessity or the indication of continued individuality, exhibit this quality of necessity, for we know that even proper names possess some meaning whereby their continuity with the rest of reality could be traced. The disjunctive judgement, which is the highest type of all judgements, has within it the categorical and the hypothetical aspects well balanced.

The judgement of enumeration marks a further step in the evolution of thought. In measurement, we have a grasp of the object in its wholeness e.g., 'This table is 5 ft. long'. The parts or the measured units of length are only contributory to this 'wholeness'. In enumeration we presuppose a 'whole' and then enumerate the units which constitute it. Here again we see the working of the principle of identity in difference. The units are separate and independent, while the logical order and the limit in the counting of parts prescribed by this logical order, exhibit a continuous quality which is the identity.

In a plural judgement like '335 members of the House of Commons are liberals', the numerical designative presupposes a knowledge of the total number in the House of Commons. In a collective judgement like 'All the books in my shelf are German; where enumeration is complete, there is a further advance in the amount of meaning attached to the numerical designative.

The exhaustive judgement marks a further step, in that it implicitly recognises a connection between the subject and the predicate. No doubt, it is a popular and unstable form of thought. Where complete enumeration is not possible, we observe some cases and jump to a conclusion, e.g., 'All men are mortal' from some instances of mortality.

Under the head 'Enumerative Judgements', we must also class judgements of mediate counting. Here, we resort to ideal units of number instead of directly counting the concrete units, e.g., 'Instead

of saying that my shelf contains 10 books in German, 2 in English and 4 in Italian, I say that the number is 16.'

Abstract counting and Infinite series signify meaningless processes. We can employ the device of enumeration only, if there is, to begin with, a whole to be numbered. An infinite number is a case of difference without identity. It exhibits parts without a whole.

A propos of judgements of measurement, the question of Infinite time and Infinite space arises. In a judgement like 'It is three years since I last saw him' we presuppose a system of time-measure. The sense of time is the mere consciousness of continuity in successions. Consciousness is the screen on which the succession of events has to appear. One series appears to us to have more duration than another. Hence, for practical convenience we set up a standard of time by reference to which, measurement of durations, is possible.

Like number, temporal quantity also can be simple and complex. 'He died three years ago' is simple enumeration in time. Judgements using units of measurement like '365 days = 1 year' in the abstract, are complex. Like number, enumeration in time also can be infinite. But, infinite time like infinite number, is a meaningless abstraction. Actual events in history are significant facts for us because of their 'wholeness', their positive character and not because of their serial or unending nature. 'The human mind and will are always busy in turning a series into a coherent and almost individual whole, projected more or less definitely on a scene of time and space, but not exhausted in its meaning by the nature of that background' (Logic. Vol. I, p. 184.).

Judgements of space, belong to the same category as those of time. In these also, the idea of infinite space is brought in, only to be discredited. For examples dealing with judgements of abstract space, we have only to go to the science of geometry with its innumerable laws concerning spatial relations of figures.

Passing from these enumerative judgements, we come to the singular and universal judgements, e.g., 'Caesar crossed the Rubicon'. Here we have a singular judgement the meaning of which is universal. When I assert that 'Caesar crossed the Rubicon', I mean that Caesar who had done so many things and who stands for so many qualities has crossed the river Rubicon, a further light on his personality. This aspect of universality is brought out more clearly in the corporate judgement in which, instead of a proper name standing as the subject, we have the reference to a unity of individuals, e.g., 'The ancient Greeks were at once a most scientifically and a most imaginatively minded race'. In the collective Judgement (e.g. All the books in my shelf are German) the reference is to a sum of enumerated particulars. In the former, we ascend to a statement of a general fact, the reference to number i.e., to individuals remaining in the background.

In individual or singular judgements, the time in predication has

some importance. In the corporate judgement it decreases in importance and in the universal judgement the time-factor is totally absent, e.g., 'Man is an animal capable of social life'. The connection of content is the all-important thing here. The subject is both abstract and concrete. It does not mean any particular individual. At the same time there is present that individual character, for, the term 'Man' includes all individuals.

Universal Judgements can also be hypothetical. The subject here, does not stand on its own legs but is dependent on what follows from it, e.g., 'If A is, B is.' Hypothetical judgements have their bases in concrete reality. Otherwise they are meaningless. A proposition like, 'If one man is throughout the whole period of his conscious life alone in the Universe his moral purpose would be nothing but to please himself,' posits a moral world which cannot exist. Hence, the consequence which follows from it, is meaningless. Unless a supposition is grounded in concrete reality, there is no scope for making any judgement at all.

Negative judgements are like hypothetical judgements, for, in these also, there must exist positive systems behind them to supply them with meaning. A judgement like 'That fire is not out', implies that the fire is still burning and a host of other things connected with this fact like, say, 'the servant might have put some more wood into the fire,' 'there may be some one in the room' etc. Bare negation is meaningless. Just as positive judgements imply some negative relationship or other, so also negative judgements must have some positive significance. The difference between them is, as Bosanquet says,'—that affirmation presupposes the idea of negative relation in general, while negation presupposes the idea of a corresponding affirmative relation in particular' (*Logic*, Vol. I, p. 297.) Bare negations like, 'A stone is not—Christian,' 'virtue is not—square,' are a mutilation of all intelligent thinking. They exibit difference without identity just as tautological judgements exibit mere identity without difference.

The fact that hypothetical and negative judgements are meaningless unless they have some connection or other with some part of reality in a positive sense, indicates a higher truth. And that is, that there are no ideas which do not qualify reality. Any idea which goes against this rule, that is, which 'floats' as, for example, random imagination or utopian dreams, has to be considered as an example of a meaningless abstraction. On the very face of it, it will show itself as absurd, e.g., 'Stone is not—Christian,' If man were perfect, there would have been no war, etc. Floating ideas have all their bases somewhere or other in reality. As Bradley points out in his 'Essays on Truth and Reality,' 'Because there are many worlds the idea which floats suspended above one of them is attached to another. There are in short floating ideas but not ideas which float absolutely. Every idea on the contrary is an adjective which qualifies a real

world, and it is loose only when you take it in relation to another sphere of reality' (*Ibid.*, p. 32.) Floating ideas were never a problem to Bosanquet, for, unlike Bradley, he realised from the very beginning, their necessary connection with some bit of reality or other. In this connection it will be noteworthy to add that Bradley, on whose ideas Bosanquet to some extent depended in his 'Logic,' betrayed more or less a belief in the existence of floating ideas in his early writings. 'There is force in this objection, (the objection against the non-existence of floating ideas) and with myself, I admit, the objection at one time more or less prevailed.' (*Ibid.*, Chap. III, p. 29). Referring to Bosanquet, Bradley writes in the same page, 'I should have added that from the first and throughout Prof. Bosanquet has consistently advocated the true doctrine.' He adds that 'The debt which philosophy owes to him here has not been adequately recognised.'

So much with regard to hypothetical and negative judgements. Coming to the disjunctive judgement which is considered to be the highest stage in the development of the judgement—process, we might point out, that it can occur at any level above, say, judgements of comparison. It may originate in a conjunction of judgements with a common subject. A proposition like 'A diamond is crystalline and very hard and highly refractive' may be put forth with either of these conditions, which then becomes disjunctive. The disjunctive type can also arise with the discovery of an error in a generic judgement. For example, 'Cereus is a night-flowering plant'; If a certain species of Cereus is found to be not night-flowering, we are left with the alternative 'Cereus blossoms either at night or in the morning'.

Imperfect disjunctions occur when the alternatives are not mutually exclusive or collectively exhaustive, e.g., 'He is either a knave or a fool.' Again there are disjunctions of ignorance which are imperfect types—belonging to the same group, e.g., 'Being an Oxford man he is either a University College man, or a Balliol man or etc., etc.'.

A true disjunction is a generic judgement whose content is developed or inter-related by the help of hypotheticals. We have here a system which is subjected to analysis, e.g., 'The triangle is either scalene or isosceles or equilateral'. The connections into which the self-sufficing system enters, are really hypothetical judgements, e.g., 'A is either B or C gives rise to four hypotheticals—If A is B, it is not C; If A is C, it is not B; If A is not B, it is C; If A is not C, it is B.

A disjunctive judgement which states chances, is of an abstract kind. In true disjunction there is individuality in the subject bearing distinct relations to the parts into which it is analysed. Abstract disjunction descends not from the generic judgement with its penetrating individuality but rather from judgements of enumeration. Contrast a true disjunction like 'The Constitution of a modern nation is necessarily either democratic or plutocratic' with

an abstract disjunction like 'A die must turn up one of its six sides'. In the latter the number of the parts and not their nature, is the primary aspect.

From these above-mentioned judgement types, emerge a still higher type of judgement called Inference. Inference is mediate judgement. In ordinary judgements we assert something directly of reality, while, in inference, we indirectly attribute a quality to reality on the strength of a content which is referred directly to that reality. It may be asked, 'How can one content claim to be true of reality on the strength of another content distinct from the first?' The answer is, as Bosanquet says, 'It is possible—to proceed in knowledge from content to content because the world as known consists of universals exhibited in differences, and the contents from which and to which we proceed are not shut up within their respective selves but depend on a pervading identical character or universal of which they are the differences'. (*Logic*, Vol. 2, p. 2). Inference is the indirect reference to reality of parts within a whole on the strength of the nature of that whole as revealed in parts directly referred to reality.

Inference, like judgement, is also not in time. It is not a transition beginning with data and ending with a conclusion as its explicit forms may appear to be. In a natural inferential operation, what takes place in the mind is not a temporal process, but a coming into clear perspective of the inferential act through 'jumps'. The data are not mere data, for, what are they data of? So also a conclusion is not an isolable entity, for, what is it apart from that from which it follows?

Among immediate inferences we have comparison, abstraction, recognition, distinction etc. All these processes exhibit the pervading principle of identity in difference. We compare two things on the basis of a common quality. As a case of abstraction, the following example is typical. 'He has lost his wife and yet goes on much as before. Therefore her loss has made no great change in him'. The system, viz., knowledge about the man, justifies making that inference. In recognition we identify two contents on the basis of a common quality possessed by both. In, 'This is the man who was travelling with me in the train yesterday', this is quite evident.

Inference proper assumes various shapes. Enumerative induction is one of the many types of unscientific inferences which we make in our every day life.

E.g. a, b, c, d are rational
a, b, c, d are men
∴ Man is rational.

On the strength of observation of some instances and without any scientific analysis of the connection of contents, we jump to a conclusion. As a germinal hypothesis, or, a first step towards later scientific analysis, such assumptions have their value, e.g., 'A, B, C

are great lawyers, and had classical education. Therefore has a classical education something to do with the making of great lawyers ?'. Considered as an act of inference, its claim is false or even absurd. It would amount to subsuming new cases under a general rule presupposed as such. A typical example is the formal syllogism where on the strength of a false generalisation, a conclusion is deduced.

Complete enumeration, another type, is a false ideal. The very idea of exhausting all particulars is repulsive to a scientific mind eager for analysis and for detecting intelligent connection.

There are types of inferences dealing with numerical computations. They arise from the same tendency which complete enumeration betrays. Equations, spatial and temporal relations etc., all deal with numerical calculations. They are all highly abstract and hypothetical.

Analogical inference marks a movement towards scientific inference which enumerative induction initiates. It occurs as a result of an analysis of the very premises which the latter afford.

Compare

'Almost all animals have some power of self-movement.
Almost all animals have some degree of sentience.
∴ Sentience may be intimately connected with self-movement.
(Enumerative induction)

with,

'Self-moving creatures are creatures in need of special nourishment and protection. Sentient creatures are in need of special nourishment and protection.
∴ Sentience is connected (by the requirements of animal life) with self-movement'
(Analogical Inference).

Analogical inferences of the latter type are formally invalid as they involve the fallacy of 'undistributed middle'. Their value consists in their implicit significance, which marks the movement towards scientific analysis. The explicit form of analogical inference as in, 'A is B, C is B. ∴ C is A', implies really the valid form, viz., 'B is A, B is C, ∴ C is A'. By subjecting the grounds of such inferences to a more thorough analysis we easily get the best form of inference, viz., Inference by scientific analysis.

An analysis of the relations of contents in an inference brings in the question of negative premises and negative conclusions. Negative inferences do not deviate from the principle that all inference depends on the relation of differences within an identity. It is not as bare negations that we should interpret negative judgements in an inferential operation, for, we have already seen that bare negations are meaningless abstractions.

'Man is not a monkey
Socrates is a man
∴ Socrates is not a monkey' is really of the form,

'To be a man excludes being a monkey
Socrates is a man
∴ Socrates is not a monkey'.

The formal rule that, from two negative premises we cannot draw any conclusion, is really an off-shoot of the idea of bare negation, and need not be adhered to, provided we understand negative relations in their true meaning.

True scientific induction is the result of testing hypotheses, by taking into account all kinds of possible alternatives. From the isolated data before us, we first make intelligent conjectures. These conjectures are then tested and their validity is thus established.

Strictly speaking, this generalisation is not from the known to the unknown. Though the hypothesis is not explicitly present in the data, the data only afford us the grounds for making hypotheses. Thus, for example, in an anthropological hypothesis about the past of the Hellenic race, the data bearing on it, like, the History of Europe, are interrelated coherently. The hypothesis is what is elucidated from these data. Hypotheses tested and established are not, it must be clearly stated, mere abstract laws but they stand for whole systems of knowledge. They are, in other words, 'concrete universals'.

In this connection let us take a typical case of true philosophical subsumption.

'The British constitution is in its main features determined by the thoroughgoing applications of ordinary law.

The position of the prime minister is a function of the British constitution.

∴ The position of the prime minister is in its main features determined by the thoroughgoing applications of ordinary law'.

Philosophical subsumption exhibits both concreteness and necessity. The categorical and the hypothetical aspects are in balance, as in the disjunctive judgement.

Philosophical subsumption takes the logical form in figure, the ground which helps the deduction of the relationship being the middle term. But coming to the question of formal rules it can be said here, that, understood as a prescription to which our inferential operations should conform, they are meaningless. A true inferential operation is one individual 'whole' with its own necessary connections and movement, and, therefore, the idea of strict conformity to laws of formal logic like 'Every inference must have only three terms and three propositions', is absurd.

There is another still higher form of inference, viz., Dialectics. In inference we have a system from which a conclusion is drawn. But in dialectic the presence of an explicit system of data is not necessary. It requires only a suggestion to set the development in motion. The whole becomes intrinsic. Give a mathematician a problem from his field of knowledge. His whole knowledge will react to it by a natural impulse.

In principle, of course, dialectic is not different from inference. The advance from data to conclusion is more marked in the former and, hence, instead of an advance within a single category as in ordinary inference, we find here almost an advance from one category to another category.

A word must be said here regarding the relationship between deductive and inductive forms of inference. The distinction between them is only one of aspects. Induction is inference viewed from the side of the differences, while deduction is that viewed from the side of the universal. It is wrong to say that while induction discovers, deduction proves, for, discovery and proof are involved in both. In Newton's discovery of the law of gravitation, for example, both deduction and induction played their roles. The popular story of the falling of the apple and Newton getting the clue to his theory from this, indicates that his method was inductive. But, it must be remembered that Newton had in mind a whole wealth of facts relating to mathematical relations read against which background alone the falling of the apple could have evoked in him the germinal hypothesis concerning gravitation. This is certainly a deductive process. Thus, we see, that in every complex inferential operation, there is present both deduction and induction. They often reinforce one another. Each is relied on as occasion demands and necessity prescribes.

The general nature of all inference demands further clarification, for, the rules of formal logic with regard to deduction and induction have a *prima facie* artificiality about them. It may be asked 'should we conform to the pre-fixed rules of traditional logic or should we not?' Can the natural workings of the human mind be fitted into any linear scheme? If not, what value lies in the rules of formal logic?

It must be borne in mind that the difference between an inference and a judgement is one of degree. The former is warranted by bases more complex and organised. In ordinary 'surface judgements', there are no organised complexes. The role of implication is conspicuous in inference because there is present an organised complex to give rise to the implication. We make judgements or inferences which cohere with our separate spheres of knowledge. A special complex is involved in each of our inferences. Assuming a coherent mind, 'The essence of an inference would be in showing of any suggested assertion that unless we accepted it our province of truth would as a whole be taken from us' (*Implication and Linear Inference*, p. 3).

My judgement is the implication arising from my special complex read off in relation to the rest of reality. In an example like 'According to the British Constitution, the King can only act through his ministers', we see that subject to the special complex the King can do no wrong. The special complex here is the King acting through the ministers according to the British Constitution. Reading this in the light of the system, viz., the

possibility of the King doing any wrong, we get the conclusion viz., 'the King can do no wrong'.

It must be remembered here that very often only the special complex remains before the mind, the rest of reality remaining in the unconscious, forming its background.

Implications come to us in a flash. Of course, no ultimate certainty attaches to them, for, if we have any cause for doubting their validity, we can examine their grounds, change them if necessary or even reject them.

In a true inference the assertion 'this or nothing' has great force, for, either we have to accept the truth of the implication or we have to reject the whole system of reality on which it is based.

The linear inference of formal logic must be distinguished from systematic inference. In the former we proceed according to set rules. Compare an argument like 'A is B, B is C, C is D, ∴ A is D' with one about the motions of the moon from the law of gravity. In the former we assume something and then proceed on that basis. There is no novelty in the conclusion that 'Socretes is mortal' derived from the assumption viz. 'All men are mortal'. We see an artificial procedure here, leaving us no better for our effort. An actual reasoning process is nothing of this sort. There the terms come together, modify one another and form one vital whole. The point which an argument must bring home to us should be an explanation of or a relation between two terms within a systematic complex which includes them both. Both enumerative induction and syllogistic inference make the mistake of presupposing a law first and then, deducing a conclusion, thus barring all analysis into the contents and making the whole process a mere tautology.

Are implications a priori? Do they not arise from definite systems of knowledge? The answer is that they are *a priori* but not in any absolute sense because however much an implication appears to be dependent on a complex, this complex, in its turn, has its relationship to the rest of reality.

A critic of the theory of implication might say 'If the complex is so, all the details are so, so long as it is so; this is a tautology'. Is there, therefore, any novelty in our inference? The answer to this charge is, Bosanquet says, '——If the complex is so then as long as it is so certain universal connections within it must be so not because they are given so but because in the conditions which are given and reality in general being what it is, they imply each other.' (*Implication and Linear Inference*, p. 73.) The complex in its relation to reality gives rise to a new connection which is not wholly in that complex as such.

Implications are of different types. There are, on the one hand, implications possessing a semblance of absolute apriorism. Geometrical axioms like 'Two straight lines cannot enclose a space' and logical truths like 'knowledge in its totality cannot be denied or even doubted', belong to this category. These implica-

tions are related to the whole of experience in a very direct and intimate sense. They stand for the minimum of reality so that, by denying them, we deny all experience and thus cut the ground from off our feet. We thus involve ourselves in the fallacy of 'contradiction in terms'.

There are, on the other hand, cases of implications connected with the whole system of experience by ramifications both wide and deep. They occur as a result of a significant 'seeing into' organised complexes. The test 'this or nothing' does not apply here directly. We can only show by a series of arguments how the denial of such implications, involves us in a denial of experience. If a man, for example, denies the existence of beauty, there is no apparent 'contradiction in terms' but we can resort to the argument 'No beauty, no self-expression; No self-expression, no self or responsive world; No self or responsive world, no experience of the kind we possess', (*Implication and Linear Inference*, p. 93) and, thus, show him the contradiction involved in his denial.

Reverting to the importance of considering all inference as cases of implication, it must be stated that the natural procedure in all argument is the development of a subject and not, as the linear method sets down, the subsumption of new cases under assumed generalities. Imagine a barrister opening his case. Beginning with a mass of data, he gradually takes us to the consequences which they involve. There is no question of starting with a major premise and, then, subsuming particular facts under it. The gist of his arguments lies in the appreciation of the central situation produced by all the conditions being present at once in a single case. We are in contact with the situation as a whole. To think of fitting this to any linear scheme is to take away its very life-blood.

The non-linear aspect inherent in all reasoning is, to a certain extent, noticeable even in the formal syllogism of traditional logic. 'The subject of the conclusion, the minor term', the author recognises, 'appropriates to itself an import and an amplification which first presented it did not possess' (*Implication and Linear Inference*, p. 116). There is in the syllogism first the datum or the starting point, then the actual operation and then the modification of the starting-point, which is the conclusion. The subject expands and appears in the end with new predicates.

The subject, it must be remembered, must undergo a natural and 'necessary' expansion. We cannot omit relevent elements in the data. We cannot interfere with them or bring in irrelevant material from outside. If, for example, in forming the conception of freedom we assume the environment to be necessarily oppressive then we bring in a negative element with the result that the idea of caprice or rebellion emerges in the place of that of true freedom.

The non-linear method, a critic might say at this juncture, has no principle of procedure. If my insight into a complex

carries me to one conclusion and yours on the same, to a different conclusion, how are we to reason upon them? Is inference to be considered as exempt from all criticism? On what principle are we to criticise or reject erroneous inferences? Should we not conform to the canons and laws which formal logic prescribes? The answer is that this impeachment is out of place. Inference proceeds on a general principle, and not as formal logic says, from a general principle. 'The point is not,' Bosanquet remarks, 'that there is in inference no principle but that the principle is established by the observed working of the inference and not the inference by the independent assumption of the principle.' (*Implication and Linear Inference*, p. 125.) Observe how the mind works in natural inferential operations and, then, put down the principles which they exhibit in common.

The triple rhythm is, of course, from a certain point of view justifiable. There is a tendency to a certain economy in all inference. Terms which are junction-points and premises which embody constructive insight cannot be of any number. Our quarrel is only with the idea of prescribing this law as a rigid canon to be obeyed at all costs by all inference. In fact, there are three distinguishable phases in all inference which formal logic recognises as three terms. The 'threes' in inference is a convenient way of putting a complex process into a clear economised shape. The answer to the question 'why does the blood circulate' takes the form 'whatever acts as a force-pump can maintain a circulating system, the heart acts as a force-pump, therefore it maintains a circulating system'. If the laws of formal logic smoothen our efforts in putting inferences into shape, then, by all means, let us adopt them. Their value lies only in their usefulness. Considered as pre-fixed laws demanding conformity, they are artificial devices capable of cutting the nerve of all logical reasoning.

A propos of principles underlying our thought, that is, laws which our thought life reveals, we may set down the following as the postulates of knowledge.

Formal postulates.

1. The law of Identity.
2. The law of Contradiction.
3. The law of Excluded Middle.
4. The law of Sufficient Reason.

Material postulates.

1. Maintenance of life on the earth's surface.
2. Reality of human purpose.

These are general principles latent in all experience. The distinction between formal postulates and material postulates can be brought out by the relation between'—the judgement that there is a system, and the judgement that the system is of such and such

a nature'. (*Logic*, Vol. 2, p. 206.) The material postulates indicate how the contents of experience actually behave.

The law of Identity expressed in the form 'A is A', affirms the unity of Reality. We can affirm something of Reality without reserve. Once true, our affirmations are to be considered as always true. This is the significance of the law. It should not be taken as a bare law, for, then, it becomes a tautology, an identity without difference.

The law of Contradiction marks a further step, e.g., A cannot be both A and not—A. It asserts that Reality is a consistent unity. As Bosanquet says, 'You cannot ... play fast and loose with reality. What is true at all, as the law of identity said, is true throughout Reality; but more than that every such truth is double-edged and carries with it throughout Reality consequences by which it affects and limits matters which are *prima facie* outside itself'. (*Logic*, Vol. 2, p. 210.)

The law of Excluded Middle (eg., A is either B or not—B) means that Reality is not only one and self-consistent but is a system of reciprocally determinate parts.

In the law of sufficient Reason is implied the truth that the parts of Reality determine one another. Every part of Reality will have another part as its cause.

The material postulates take into account the actual conditions on this earth under which human beings thrive and human minds develop. Our ideals often remain unfulfilled on this earth, for we live here only for 'three score years and ten'. Will the human race be swept from the face of this earth? In that case is not all this a useless and vain pursuit? The answer is that Science does not furnish any positive grounds to believe that this would happen at all, at any time. So the prospect of the continuance of the human race is to be taken '—not as an ultimate certainty but as a leading characteristic of our actual world'. (*Logic*, Vol. 2, p. 219.) Our knowledge and all our achievements, further, show that they form a significant part of Reality. The progressive content of knowledge itself bears ample evidence to the fact that '—— Reality as a mechanical system is further adapted to, or includes as elements within its unity, the substantive purposes of human intelligence, that is, is really teleological'. (*Logic*, Vol. 2, p. 221.)

Before concluding the chapter, a few words must be said of the light which knowledge-forms throw on the abstract nature of truth. There are, to begin with, two elements in every judgement. They are the mind and the objects. We cannot separate the two, for, the one is bound up with the other. What is mind apart from the objects which form its content and again what are objects unless they become contents in our minds?

To consider objects as independent of mind, is to posit minds alone, for, if they are really independent they bear no interest for us and hence cannot even be thought of. Things have their existence as we know them to be. A chair-maker's conception of a

chair is not totally different from that of a physicist. The latter, of course, knows more about it. But this does not imply that the chair is something different from what the chair-maker thinks about it.

In order to understand what takes place when a mature human mind sees an object before it or engages itself in any activity whatsoever, we need not resort to the fantastic idea of compartmentalising reality into two and say that our ideas belong to one world while the facts remain outside it. This is to make an artificial barrier between mind and objects which really constitute one whole. I see a pencil before me and what I perceive is the pencil. Of course the more I use my powers of perception in understanding it, the better for me. It is one thing to say 'You have not examined the pencil carefully; your ideas don't touch reality'. But it is a different thing to say 'you can never know the pencil fully however much you try'. The latter meant as an incentive to further effort would be useful. But if it suggests that fatalism which goes with the conception of the thing-in-itself, then it is high time that a warning is sounded.

In the chapter entitled 'The Mind on the Brentano-Meinong basis' in his last book *Three Chapters on the Nature of Mind* Bosanquet points out the error in all theories which separate the mind from its objects in any absolute sense. In the normal activities of the mind we do not find any evidence to the effect that the content of mind is referred to an object on the strength of similarity. In thinking of the murder of Cæsar, we have the images of Cæsar being murdered among a number of men wearing gowns, a particular place in which they were all assembled, the time at which the murder took place, etc. These images which are in my mind are not referred to any outside event in any artificial manner. When I speak of Cæsar's murder I do not mean any mental image corresponding to it but 'I mean an event in the real world which is itself a constituent of my affirmation about it. What I have in consciousness helps me to think about it; but what I think about is not what I possess at the moment in consciousness; not a "content".' (*Three Chapters on the Nature of Mind*, p. 52.) In sense perception this identity of content and object is clearly brought out. When I say that the pencil before me is red in colour, I do not refer certain psychical images in my mind to the pencil by the relation of similarity. What I say, I mean about the outside object.

Thus mind and its objects enter one another's being and form one whole in all our normal activities.

Some questions may be raised at this juncture. For example, 'How do you know that objects exist? Is not everything an affair of your mind? Is there any meaning in talking of things outside your mind?' The answer to these questions is, 'Well assume that it is all an affair of your mind; what then? Try to understand an object, say, the pen in my hand. Do you ever feel that the idea

of the pen in your mind is a sufficiently full picture of it? Don't you feel, as when a manufacturer of pen comes to you and tells you of what it is made, of the particular kind of metal chosen for its nibs, etc. that your knowledge of it is imperfect? If you admit that the pen transcends your idea of it, then you have virtually conceded the truth of the statement that the pen exists outside your consciousness'. Physical objects exist outside my mind. But at the same time they are inside my mind as well. This truth is expressed by the oft-quoted statement of Bosanquet that reality is both inside and outside my consciousness.

In a clear exposition of 'The nature of thought', Mr. Brand Blanshard deals at length with this topic, and the reader may be referred to this recent publication Our thought is not a representation of outside objects. It *is* the outside objects, though there is always present the fact of every bit of reality transcending our consciousness. Our thought itself furnishes the evidence. Go to it and then you will find none of the abnormal compartmentalisation of thought standing apart from its objects. A passage from the author mentioned above may be quoted here. 'If thought and things are conceived as related only externally, then knowledge is luck; there is no necessity whatever that what satisfies intelligence should coincide with what really is— But if we get rid of the misleading analogies through which this relation has been conceived, of copy and original, lantern and screen, and *go to thought itself* with the question what reference to an object means, we get a different and more hopeful answer. To think of a thing is to get that thing itself in some degree within the mind. To think of a colour or an emotion is to have that within us which if it were developed and completed, would identify itself with the object. In short, *if we accept its own report* thought is related to reality as the partial to the perfect fulfilment of a purpose'. (*The Nature of Thought,* by Brand Blanshard, p. 261-262.)

Realists like Mr. Russel, Dr. Moore, Prof. Alexander, Prof. Holt and others all seem to make the fundamental *mistake of viewing thought from without.* Hence, a writer like Mr. Russel, is of opinion that there are three separate entities involved in all knowledge. They are for him the act, the content, and the object. His 'analysis of mind' unmistakably shows these three entities. Knowledge for him is the reference of the mental content to an object existing outside it by the relation of similarity. My image remains my image only. The actual event never enters my mind. Only by a relation of similarity I am able to refer my particular mental image to the past event. The objective event and my subjective image run on separate rails and never meet. The Brentano–Meinong view referred to before maintains the same position. The separation of content and object is the dominent note in all the realistic writings. The working of universal connections within the mind would show them without any further evidence, that really, objects enter our minds. To the extent

that we are able to refer to the outside objects by the relation of similarity the objects certainly enter our minds. How on earth can we know that the 'sign-post' points towards the object unless the object works within us? As Bosanquet points out in his book *Three Chapters on the Nature of Mind,* Russel has actually inverted the relation between an image and an object. Resemblance is really 'due to the meaning or presumed from it and not vice versa'.

Looking at thought from *within* we see that every act of thought is concrete. The act, the content and the object are only phases within a developing systematic 'whole'. The 'act' as such existing as a contentless entity cannot be thought of. Again it must be pointed out that the content is not the object. The content of cognising blue is not blue but the awareness of blue. The content apprehended is not the content by which it is apprehended. But this distinction is not absolute but only relative.

The critical realist has sound ideas regarding this question. For him the objects are out there. 'But, although act of awareness and object are essentially separate entities—yet it is not indifferent to the nature of an act of awareness whether it is an act of being aware of a water-drop or of a primrose'. (*Aristotelian Society Proceedings 1916–17,* p. 326—Article on 'The Basis of Critical Realism' by G. Dawes Hicks.) In every specific act of cognition, provided we look at it from within, we find that the objects do not stand outside, waiting to be referred to by our thought. The act of thought is not a bare abstract phenomenon happening inside one's mind. Each act of thought has its own individuality. In the article referred to above the writer says '——Viewed from within, the act of being aware of red *is,* for the conscious subject, a specific act clearly distinguishable from the act of being aware of blue, and that, in the relation of perception, it is *this* act, with its definite content "awareness of red", and not merely "awareness" *simpliciter,* over against which the "red" which is a quality of the object stands'.

In this point of looking at thought from within, the idealist is one with the critical realist. The belief that objects stand apart from the mind unaffected by its life and invulnerable, arises from the mistake of viewing thought from without.

Therefore our ideas of things are certainly the things, though, of course, with greater and greater organisation the former will give a fuller account of the latter. There is no distinction in principle between the two. Widen your ideas, make them 'wholes' in the true sense of the term 'whole' and you are nearer your goal. My idea of an object possesses value only in so far as it is universal. Without this universality and concreteness ideas cannot transcend their psychical nature. There is always scope for further and further widening our ideas since at every stage there will be some bit of reality which remains to be absorbed by the mind. My idea of a hat, for example, must take into account

all kinds of hats, their peculiarities, their use, etc. My enquiry after the nature of even the smallest object on this earth will ultimately land me in the whole universe. In other words the subject of every judgment is Reality itself. But since this kind of perfect knowledge is not humanly possible, we have to rest content with the utmost that we can attain. In so far as my ideas are to a certain extent perfect, they can be *called* concrete universals though *the* concrete universal is the universe itself which includes everything.

Truth is, thus, a coherent idea, a concrete universal. The all-inclusive nature of ideas is what is implied here. The truth about the future of Europe, for example, is my coherent idea about it, enveloping as it does a whole wealth of facts, a study of European affairs, an acquaintance with the policies of various European states and a host of other things, including, certainly, a direct experience of many of them. The standard of truth, is greater and greater coherence with Reality. Organise your ideas; base them on definite complexes, on 'wholes' in the true sense of the term 'whole'; then your ideas will contain truth. Truth and error are relative terms. An erroneous assertion under one condition can become true under another condition. There is no *state* of error, for an act of judgment implies belief in its truth. We base our judgments on complexes. But if a more well-informed man on the matter comes round and says that you are wrong because of such and such erroneous or incoherent items in your system of knowledge, then only you realise the state of error you are in. The work of modification of your system begins only then. Either you modify it or reject it altogether and start anew. Your judgment, thus, undergoes a change, a change consequent on greater organisation. Your system of knowledge becomes a 'whole'. The difference between truth and error is only one of degree. Greater organisation and greater coherence go with higher degrees of truth. The ultimate standard is, of course, the whole universe itself.

In closing we shall see how the question of degrees of truth arises out of this position. You make a judgment basing it on a definite system which is in your mind. Your judgment, of course, must cohere with your system. If not you are lying. You are deliberately falsifying your system of ideas. In the case of insane people whose utterances have apparently no coherence, what is remarkable is the complete lack of any organisation whatsoever within them. The question of judgment cohering with any system does not arise here at all as the latter is conspicuous by its absence.

In all ordinary judgments, there is involved an organised system of ideas. Your judgment possesses truth only in so far as this latter is a 'whole'. In order to be a 'whole', your system of ideas must envelop the whole region of experience and ultimately the whole universe itself. But this is not humanly possible. Our ideas never form a 'whole' in the true sense of the term.

They are bound to be to a certain extent disorganised and partial. Hence our judgments, coming out of such partial 'wholes', will not be true in any ultimate sense. They can only embody degrees of truth. Imagine a school boy who learns arithmetic and for whom '$2+2=4$', bears a meaning. The truth of '$2+2=4$', has to be read against the background of arithmetical knowledge which he has. Compared to the significance which the statement has for the school boy, a mathematician's understanding of the same formula is profound. It embodies for him a whole wealth of arithmetics. Hence '$2+2=4$', has more truth for his mind. This example can be multiplied indefinitely. Our judgments possess degrees of truth, depending on the character of wholeness which our respective systems possess. In a false judgment like, 'The earth is flat', the whole system is on a false basis. The knowledge of astronomy possessed by the mind in question has to be rejected 'in toto' and substituted by one which is really a 'system', that is, which possesses internal coherence as well as coherence with the rest of reality. Of course internal coherence will not be complete unless the system under consideration coheres with the whole reality which in the end involves and becomes the whole universe. The absolute is the ultimate criterion. Anything short of it will not be a true 'whole'. But then if the Absolute becomes our system we are no more on the level of discursive understanding. There is no more any need for making judgments at all. There is no more any distinction between subject and predicate, each transcending the other when looked at that way, wherein consists truth, knowledge and all that relate to the discursive understanding. The absolute is all-in-all. Truth is an attempt to reach that perfection which when once reached transcends that level. Of course, finite human beings that we are, the Absolute can never be reached. Our systems can never be of the nature of a true 'whole'. But our partial 'wholes' and the degrees of truth embodied therein, indicate our yearning after the true 'whole' and it is on this yearning that depends our individuality.

CHAPTER IV

GOODNESS

The good man is one who is always 'equal to the situation'. Present actual situations to him and his whole self will be ready to react to them to the extent that his experience of the world could enable him to do so. His knowledge of the world helps him because he can read the situation in the light of other similar situations he has already experienced. It cannot be asserted, however, that his conduct issues from his knowledge, for, there are considerations other than his knowledge, like, say, elements within the moral situation itself, especially if the latter is complex, which

can influence and even recast his experience or knowledge of the world. The relation between knowledge and conduct or rather, theory and practice, is reciprocal. They reinforce one another and produce the harmonious experience which is the 'whole'.

Theory understands objects in their relationships, primarily a cognitive process, though in thus understanding objects much that is 'practice' is also involved. In practice, we with our will actively deal with situations as, for example, in an effort to avoid war we actually go out to the militant nations, discuss with their leaders matters affecting their policies, adjust and concede, if necessary, interests affecting one nation or the other, and thus achieve what our minds set out to do. It is this that we call conduct and the term 'goodness' is the quality that we attach to one whose conduct is satisfactory.

Theory and practice correspond to truth and conduct. Though both are in ultimate meaning one and the same, for in both we are yearning after self-realisation, yet there is a distinction of aspects between them. Both goodness and truth contain, no doubt, the separation of idea and existence and involve a process in time. But in truth we start with existence and we go on to complete ideally what really must be there. In goodness, on the other hand, we start with an idea of what is perfect and then either find the same in existence or make existence correspond to the idea. Truth is, in other words, ideal completion of the existent, while goodness is existential completion of the ideal.

This is a distinction which we have to bear in mind. But this distinction is only one of aspects. Both truth and goodness aim at the same goal, viz. self-realisation. In common parlance the former denotes a coherent cognition while the latter denotes a coherent action.

Conduct (or the actual realisation of the good) with which alone we are concerned in this chapter, issues from the will of individuals. This will whose power we feel in voluntary actions is no mysterious principle capable of turning any and every situation to its own advantage irrespective of other factors involved in the course of its employment. It has a concrete content every time it acts. This content is furnished by thought or the experience of the individual concerned. The novelty attending an achievement of the will is the result of reading a moral situation in the light of this content which the will can bring to bear on the situation. The limit of its achievement lies therefore in the strength and content of the mind in question.

When is an act of will called good? We can say in answer 'when it satisfies the desires of the particular mind which judges the act'. The 'good' and the 'bad' or the 'evil' are essentially attitudes of the mind. Virtue, justice, temperance, etc. are terms applied to the higher forms of the good. Evil is the desire for the bad. In a bad act, we go against our nature. As Bosanquet says '——It is the inclination to a satisfaction which is attended by

dread or hostility against the threatening absorption in good' (*Value and Destiny of the Individual*, p. 193).

An act is good only in relation to another which is less good or which is evil. Good and evil are relative terms like Truth and error. An object of desire which is good to one, can be, at the same time, bad to another who looks at it from a different point of view. It is not the content of an object which makes it good but the side assigned to it in the conflict of attitudes that is decisive of its goodness or badness. Of course, it is left to a third man with greater experience to say which of the conflicting attitudes taken, represents the true character of the act.

Thus we see that when we speak of goodness we at once think of a voluntary action. The judgement of goodness, consists in the satisfactionness of a willed action. This is, in other words, the judgement of value. In a wider sense this judgement of value attaches itself to the quality of satisfactoriness of all outside objects. We say 'this poem is good', 'that pen writes well' etc., meaning thereby that we attach values to these picked-up external objects. Value, worth, and goodness are all terms indicating the same character of objects. 'Goodness' used in this sense, has a 'prima facie' justification and covers certainly a wider field of our experience than 'goodness' attached to forms of human conduct.

It is said that the judgement of value is indefinable. 'To define it, to say that it is one with some other term, is alleged to be substituting the other term for it and so removing and abandoning the idea itself' (*Some Suggestions in Ethics*, p. 47). But is this (the indefinability of the good) not a mark of our ignorance? Is its indefinability similar to that of the qualities given to sense-perception, e.g. yellowness or sourness? An object is definable only in proportion to the degree of structure which it presents. This is least so in sensuous qualities. But, it may be argued, in sensuous qualities we can at least point out the sensations corresponding to each quality. In a judgement of value even this is impossible. The point is that sensuous qualities cover only a minimum of experience and hence they can be pointed out and described, while judgements of value, by their all-comprehensive nature, cover such a wide field of our experience that very often definitions would not do adequate justice to the objects judged.

Good or value is a category. It covers whole systems of experience. This all-comprehensive nature of value makes it difficult to define. Good or value is, according to Bosanquet, "a category of which at least a great many objects present the character but which is itself present as a whole in none. It is not given in perfection anywhere, at any rate in such experience as ours" (*Some Suggestions in Ethics*, p. 51).

In judgements of value, it is said, the peculiar attitude of the mind to the objects whose value is judged does not matter. This is to a certain extent true, for, the value of outside objects does not wholly depend upon what attitudes we take about it. Hence it is

better to say that an object of value is that in which 'I find myself affirmed' rather than that it is an object of desire, as said above. But, warning must here be given of a possible tendency to isolate objects of value from the attitudes of minds towards those objects, with its inevitable lapse into the conception of the thing-in-itself. It is the mind that judges whether an object is good or bad, and the attitude of the mind is certainly part of the whole process. "When we scrutinise any instance of value we find its capacity to meet our need and sustain our self-affirmation to be one with its structure. That is to say, its mode and amount of positive being is such and so arranged as to present in determinate harmony a relatively great variety of features or, in other words, to cover solidly—that is without internal discrepancy—a relatively large area in our experience". (*Some Suggestions in Ethics*, p. 55.) A good poem, we say, has so much in it. It exhibits a system of experience in which we realise ourselves and hence the immediate recognition of its value. This property of coherence and lack of contradiction and self-discrepancy, is a consequence not of its vacancy but, on the other hand, of its positive unity and comprehensiveness. In a good political constitution, in a good life, in beauty, truth, physical health, etc. this quality of comprehensiveness and freedom from contradiction is clearly noticeable.

The recognition that in an object of value we are affirmed or reinforced, and the inherent conation towards unity and self-completeness as exhibited by the good will are, as was stressed above, different forms of the central feature of our life. But, then, how is it that the goodness of the good will is the most direct form of the good? It is good without qualification. "Nothing can possibly be conceived in the world or out of it which can be considered good without qualification except a good will" (*Ibid.*, pp. 58–59). The truth of this statement is accepted beyond doubt on all hands. Does this not suggest that value is really unintelligible apart from incorporation in a whole where its quality can display itself and be appreciated? A will that is not a mere empty principle but, on the other hand, a principle with an organised content of its own, recognises a value only where it finds itself affirmed. In conduct the side of mind is more predominant than that of objects. The concrete will acts on its objective surroundings in a way that satisfies it. The objective world is here relatively passive. On the other hand, in ordinary judgments of value, we find that the mind which is apparently at rest recognises an active impringing system almost imposing its self-maintenance and stability on us. A good poem almost wakes us up. Of course, this does not imply that value is not immediately recognized by us wherever it is found.

In conduct as well as in ordinary judgments of value, we find only a difference in degree in the part played by the mind. In willed action mind predominates. Nevertheless, as we have already

seen, will is not an empty principle but one with a concrete content. It cannot but take into account objective facts which very often even control its procedure. No doubt, here, mind holds the reins. In judgements of value, on the other hand, outside objects dominate, though even here mind has an important role, for, unless value is recognised in them, they do not bear any interest in our lives. In conclusion, we may therefore set down that both in conduct and in ordinary judgements of value about objects of the world, there is present only different forms of the one ultimate principle that the perfect experience is the 'whole' where mind and object unite together to form one unity.

In dealing with goodness we have to devote our attention to conduct. Our field of study is willed action and not outside objects and their structure. Ethics deals with human conduct and the moral life of the individual. Only in them is the nature of goodness fully revealed.

The moral life of the individual is one continuous effort towards the good. Just as in the field of truth, we have to note that there are degrees in the attainment of this good. In every good act of the individual he is affirming himself, transcending his finite discrepant self. There is present an aspect of self-affirmation as well as an aspect of self-transcendence. Let us examine a typical case of good conduct, that of a man jumping into the water to save another on the point of drowning. Here, a unique situation presents itself to him in which he has to use all his resources. But all his resources are of no avail unless he affirms himself in this unique situation and meets it fully. The solution of the situation leaves him a better man because the situation not only called forth his resources but made it richer by its individual contribution. Herein comes the element of self-transcendence. By transcending his finite self, he has certainly affirmed himself. His finite-infinite nature shoots up a degree higher. In evil we set up a world which refuses to become part of the harmonious whole. We do an evil act and become less worthy of our finite-infinite nature.

Good and evil are, of course, part of the hazards and hardships of finite self-hood. The level of experience where good and evil prevail, is a finite level, infested with pain, and pleasure, contradiction and appearance. According to our separate stations in life, we proceed with our efforts and if we are true to our nature our efforts will be directed to the attainment of higher and higher goodness. Being strictly on the moral level none of the good could give us complete satisfaction, for, there is the spark of the infinite demanding greater and greater self-transcendence. The world is so vast that at every point in our effort after the good there will be a higher good to which we can look forward. In this continuous effort the good constantly fights against the bad. 'Evil' is necessary for 'good' because it is in the conquest of the former that the latter has its being. So also 'good' is necessary for 'evil' because the latter exists only as something opposed to and in

conflict with the former. 'Good' and 'evil' are relative terms. That is why the facts of pain and suffering give us no ground to condemn the world as a whole. Pleasure for one can be pain for another. The poor and the suffering members of humanity have their own happy existence. The very fact that evil can be overcome by good shows that evil is not real. In social amelioration, relief-work in aid of the 'homeless', abolition of cruelty towards animals, in all these efforts we are trying to redeem a feature of our finite life which, of course, by our very finiteness, bars complete attainment. Evil is partially overcome by a good which thereby derives a new strength and stability.

Those who believe that evil is absolute and cannot in any way be removed from finite life have a tendency to disparage this life altogether and hold to conceptions like compensation in another life. The universe is thus made to appear just. 'There will be a supernatural recompense which will cancel previous pain and fulfil all unfulfilled moral striving'. (*Some Suggestions in Ethics*, p. 94).

Bosanquet points out that this attitude towards life is the consequence of an imperfect understanding of the finite-infinite being. True, moral progress is bound to be unending. But our efforts are not a waste in spite of the fact that they ever remain unfulfilled. The fact is, that in our highest experiences, in appreciations of beauty, in the highest judgements of value and in all such comprehensive experiences, we are assured of a oneness with reality. It is this ability to become one with the universe that marks the spark of divinity in us. The 'best' in us is the whole universe. This is our inspiration, keeping our finite lives going, in spite of its many hazards and hardships. The 'best' in us becomes our ideal. Hence we are continually on the move to achieve that ideal.

The theory of compensation in a future life arises out of the belief in the absoluteness of evil. Bosanquet says that 'In principle if you admit compensation as a working necessity, morality is done away. You are afraid to admit that self-sacrifice is a reality and heroism a genuine fact. You have entertained a 'why?' which is fatal to the moral attitude, which at least demands that good shall be aimed at for its own sake' (*Some Suggestions in Ethics*, p. 95). In other words, moral laxity is the inevitable result of such an attitude.

If you look at the life of plain men and women, you find that none of these artificial 'insurance schemes' have any bearing. They realise that evil exists. They do not lapse into pessimism on account of this because they know that it could be overcome by good. Of the ordinary man, Bosanquet says, 'By will, and in the social whole by sight, in the religious whole by faith, he throws himself beyond himself, and in spite of his badness and suffering, and fully confronting it, he claims as his own the good into which he has thrown his heart' (*Some Suggestions in Ethics*,

p. 100). Though he does not explicitly work for justice, virtue, truth, etc. in his life and by his life he unconsciously contributes to the total effort of the community towards their achievement. He may have no interest in the political affairs of his country. He may not attend lectures on 'Civilisation' and 'Social advancement'. He may not have heard of the scientific inventions of his day which add to the progress of the world. But yet, by his simple and honest life, his regularity in turning up in the field to do his manual work, in being a kind neighbour, an honest man and a law-abiding citizen, he makes his own contribution to the good of the world. The work of men who lie in 'unvisited tombs' in handing to future generations the whole wealth of traditions which form part of the achievement of a community, can never be exaggerated. Of course, this aspect of the work of ordinary men and women in contributing indirectly to the welfare of the world, is no belittling of those who work directly for the highest 'good'. The social good, for example, is an ideal, achieved by service to fellow-beings. There are those who keep these ideals directly before their vision, and those who do not, but at the same time do as much service to the world as the former.

The work of ordinary men and women in contributing to the progress of the world is less marked than those more well placed in life and with greater facilities for the achievement of definite results. But, we must remember, the former class of people do what, under the circumstances in which they are placed, they can do. This fact has a wider significance. It points to the profound truth that morality is inward. Morality does not consist in the results achieved by a particular mind, for these depend on outside facts, in fact, on non-moral conditions. Results are a matter of chance. A man may have natural defects. His conduct may not therefore achieve its end. But he is not to be blamed for this failure to achieve results. As Bradley says 'It is, in short, only that which comes out of the man himself which can justify or condemn him, and his disposition and circumstances do not come from himself. Morality is the identification of the individual's will with his own idea of perfection. The moral man is the man who tries to do the best which he knows'. (*Appearance and Reality*, p. 382). If the best he knows and achieves is not the best, the individual in question cannot be held morally responsible, for he is doing the best he can, under the circumstances in which he is placed.

This view of morality vindicates the work of ordinary men and women. No pride of superiority can legitimately find a place in the minds of the educated or the socially advanced. Do what you can under the circumstances in which you are placed. This must be the motto of every one who cares for moral goodness. The good man acts up to a situation with all the resources he can command. He is judged by this standard and this alone, viz. whether he really acts up to the situation which demands his resources.

It would be appropriate to point out in this short account of the nature of goodness how and where the sphere of moral goodness meets that of truth and beauty. In a sense truth is also a value. Take for instance a judgement of truth. 'The Cheetah is the fastest land animal'. Herein is embodied a system of knowledge, whose claim to correctness could be verified by observation and experiment. No one will dispute that it is a valuable piece of knowledge. Its value depends on its truth, that is, its freedom from discrepancy. The criterion is the same with regard to our judgements of value as well as willed actions. Each involves the other. It is suggested by some people that all immorality is reducible to falsehood. Stealing, for example, is the assertion of something to be yours which is not so. Truth here obviously encroaches on morals. Though to be truthful is not, strictly speaking, identical with being good, yet in principle they are the same, for we are regulated in both spheres by sound and comprehensive ideas, freedom from discord, narrowness and supersition characterising both. In the valuation of beauty the same standards apply. 'In it we are quiet, sane, and harmonious. And thus we are led on to the coherence of all the qualities which go to a complete personality and we recognise that their separate names are provisional and popular distinctions, but that really and genuinely each is such as to presuppose all the rest'. (*Some Suggestions in Ethics*, pp. 61-62.)

In conclusion, we shall see how far, if at all, ethical theory could influence moral conduct. Does moral Philosophy help us in any way in our everyday conduct? Is its function to prescribe particular rules in particular situations?

An enquiry into the nature of goodness and how the many good things of life embodied in social institutions, in religion, in art, etc., are developed from particular courses of conduct of particular finite individuals is, what is known as moral philosophy. In so far as it makes us more appreciative of and more secure in the points of view involved in our every day conduct, it has a value of its own. But on no account should it be understood as giving us ready-made principles on which to act. This is so not because metaphysics on which moral theory depends deals with conditions too remote to be in any sense applicable to human life. A metaphysics worthy of its name must study all degrees of reality and all leading experiences of our world. It is a study of our 'higher experiences' in the true sense of this expression, and that is, our experiences not exclusive of their bases in every day conduct but, on the other hand, inclusive of every possible detail of it, built up from it and developed on the standards of coherence and all-inclusiveness. "The true reason why Moral Philosophy can neither lay down general rules for conduct, nor pass sentence on particular actions lies", as Bosanquet says, "in the nature of any attribute which involves completeness of Individuality". (*Science and Philosophy*, p. 145.) Every moral situation

is unique in itself and no prescription can adequately suit its needs or requirements. The moral agent must be left alone in his actions. The only criterion on which a situation can be dealt with is the individual system concerned in its own advance or, what amounts to the same thing, another system such as to include it. And this belongs only to the moral agent or to one who can command the system, which is almost never, especially in the sphere of morality. Regarding a scientific theory we might say that its criterion is agreement with facts. When we apply this to the theory we find that we must know the facts as the author of the theory understands them or differently. In the former case, we approve of the theory because we understand the facts as he does. In the latter case, we cannot apply the criterion unless we know more about the facts than he does, in which case our original criterion breaks down leaving in its place another criterion, namely, that you are able to judge whether a theory is true or false only if you know more about it The criterion of all science is this, that it is the science itself in its further advance. In morality the same applies to a certain extent. But there is an important difference here '——to know whether a subordinate rule or a particular action points to the best course under all the circumstances of the given case, we should have to include as part of our experience the entire context which makes up the individuality of the moral agent in that action. And in morality there is the peculiar difficulty that the most important part of this context lies within the agent's own mind, and cannot possibly be known to any one else and is indeed but imperfectly known to himself'. (*Science and Philosophy*, p. 145). The innermost forces, conscious and unconscious, working in the moral agent, cannot be shared by others, and, hence, a prediction regarding his conduct in a particular situation is bound to be merely hypothetical.

Moral philosophy, as was said above, has its value in so far as it helps the agent in his end-seeking as well as in the means he adopts for its realisation. In reacting to a situation he can make use of his whole knowledge which includes no doubt his ideals. The great moral ideas of the world like 'Life is the practice of dying', 'Goodness is knowledge and vice is ignorance', 'Society is an organism' etc., are all living truths which could be used as mottoes for conduct in every one's life. Our conduct is by no means to be viewed as deductions from them Rather they are its guiding principles. Of course we cannot make a man out of ethical theories. But, certainly, these latter can influence him to a great extent and make his life richer so that the conduct which issues from his experience will have all the uniqueness that true individuality possesses.

(*To be continued*)

PUBLICATIONS OF THE MADRAS UNIVERSITY

(Text-books, Calendars and Question Papers have been omitted.)

Name of Publications	*Price.*

DEPARTMENT OF INDIAN HISTORY AND ARCHAEOLOGY

	Rs. A. P.
Sources of Vizianagar History, by Dr. S. Krishnaswami Aiyangar, available from the Superintendent, Govt. Press, Mount Road, Madras .. .. .. each	4 8 0
The Nayaks of Madura, by Mr. R. Satyanatha Ayyar, available at the Oxford University Press, Madras	*8 0 0
History of Pallavas, by Mr. R. Gopalan, M.A.	5 0 0
Hindu Administrative Institutions, by Mr. V. R. R. Dikshitar	6 0 0
Historical Inscriptions in S. India, by Robert Sewell. Ed. by Dr. S. K. Aiyangar ..	10 0 0
Origin and Early History of Saivism in India, by Mr. C. V. Narayanan	5 0 0
Studies in Cola History and Administration, by Mr. K. A. Nilakanta Sastri	4 0 0
Mauriyan Polity, by Mr. V. R. R. Dikshitar	6 0 0
The Colas, by Mr. K. A. Nilakanta Sastri	
Vol. I.	8 0 0
Vol. II.	10 0 0
Studies in the History of the Third Dynasty of Vijayanagara, by Dr. N. Venkataramanayya ..	5 0 0
Economic Conditions in Southern India (A.D. 1000-1500). Vols. I and II, by Dr. A. Appadorai ..	10 0 0
Administration and Social Life under the Pallavas, by Dr. C. Minakshi	5 0 0
Foreign Notices of South India, by Mr. K. A. Nilakanta Sastri	4 8 0
Some Aspects of Vayu Purana, by Mr. V. R. R. Dikshitar. (Reprinted from the *Journal of the Madras University*)	1 0 0

---

* Members of the staff of colleges will be offered copies of the book for sale at Rs. 2 per copy. Applications for copies should be endorsed by the Principals of the Colleges concerned.

University Publications—(*continued*)

Name of Publications	*Price.*		
	Rs.	A.	P.
Dutch Beginnings in India Proper, by Mr. T. I. Poonen	1	0	0
A Report on the Modi MSS. in the Tanjore Palace Library, by Mr. R. S. Shelvankar	1	0	0
Vijayanagar—The Origin of the City and the Empire, by Dr. N. Venkataramanayya	2	0	0
The Matsya Purana—A Study, by Mr. V. R. R. Dikshitar	1	0	0
Velugotivarivamsavali, by Dr. N. Venkata Ramanayya	2	0	0
Administration and Social Life under Vijayanagar, by Mr. T. V. Mahalingam	7	0	0
Historical Method in Relation to Problems of South Indian History, by K. A. Nilakanta Sastri	1	12	0
Lalita Cult., by V. R. Ramachandra Dikshitar	3	0	0
The Early Muslim Expansion in South India, by N. Venkataramanayya	6	8	0
Early History of the Andhra Country, by Mr. K. Gopalachari	5	8	0
Further Sources of Vijayanagara History—3 Vols., by K. A. Nilakanta Sastri and Dr. N. Venkataramanayya.	21	0	0

DEPARTMENT OF SANSKRIT

Katyayana Pratisakhya, Ed. by Pandit V. Venkatarama Sarma	4	0	0
Rgvedanukramani of Madhava Bhatta, Vol. I, Ed. by Dr. C. Kunhan Raja	3	8	0
Brhati, Ed. by Pandit S. K. Ramanatha Sastri			
Part I	5	0	0
Part II	2	8	0
Linganuasasana, Ed. by Pandit V. Venkatarama Sharma	1	8	0
Taittiriya Pratisakhya, Ed. by Pandit V. Venkatarama Sharma	2	0	0
Critical Studies on Katyayana's Sukla Yajurveda Pratisakhya, by Pandit V. Venkatarama Sharma	4	0	0

University Publications—(*continued*)

Name of Publications	*Price.* Rs.	A.	P.
Sphotasiddhi, by Pandit S. K. Ramanatha Sastri	3	0	0
The Unadi Sutras in Various Recensions, Ed. by Dr. T. R. Chintamani—Part I	3	0	0
,, ,, ,, II	2	8	0
,, ,, ,, IV	4	0	0
,, ,, ,, VI	3	0	0
The Rg Veda Bhashya of Skandaswamin (First Astaka)— Ed. by Dr. C. Kunhan Raja	6	0	0
Prakatarthavivaranam, Vols. I and II Ed. by Dr. T. R. Chintamani..	13	0	0
Nanarthasangraha of Ajayapala, by Dr. T. R. Chintamani	1	8	0
Sarasvatikanthabharana of Bhojadeva, Edited by Dr. T. R. Chintamani	6	0	0
Nayaviveka of Bhavanatha Misra, Edited by Pandit S. K. Ramanatha Sastri	3	0	0
Sahityaratnakara, by Dr. T. R. Chintamani (Reprinted from the *Journal of the Madras University*)	1	0	0
Raghunathabhyudaya of Ramabhadramba, Edited by Dr. T. R. Chintamani	1	0	0
Sarvatobhadra of Ramakanthacharya, Ed. by Dr. T. R. Chintamani	5	4	0
Vararucaniruktasamuccaya, by Dr. C. Kunhan Raja	2	0	0
Slokavartika Vyakhya by Umveka, Edited by S. K. Ramanatha Sastri	6	8	0
Prakriyasarvasva by Narayana Edited by Dr. C. Kunhan Raja	3	4	0

DEPARTMENT OF INDIAN PHILOSOPHY

The Siddhantalesasangraha of Appayya Diksita, Ed. by Mr. S. S. Suryanarayana Sastri			
Vol. I.	5	0	0
Vol. II. Roman and Sanskrit Text	3	0	0
Sanskrit Text	1	8	0
Samkhya Karika Studied in the Light of the Chinese Version (Bulletin No. 1), by Mr. S. S. Suryanarayana Sastri. (Reprinted from the *Journal of the Madras University*)	1	0	0

University Publications—(*continued*)

Name of Publications	*Price.* Rs.	A.	P.
Sivadvaita Nirnaya, by Mr. S. S. Suryanarayana Sastri, M.A., B.SC. ..	2	8	0
A Critique of Difference (A free English Rendering of the Bhedadhikkara of Narasimhasramin), by Mr. S. S. Suryanarayana Sastri and Mr. T. M. P. Mahadevan ..	1	0	0
Tattvasuddhi of Jnanaghanapada, An Advaita Classic of about the 10th century A.D., Edited by S. S. Suryanarayana Sastri and E. P. Radhakrishnan	3	8	0
Sivadvaita of Srikanta, by Mr. S. S. Suryanarayana Sastri	5	0	0
Sankhyakarika, (*3rd edition*) by Mr. S. S. Suryanarayana Sastri	2	8	0

DEPARTMENT OF ECONOMICS

Some South Indian Villages, by Dr. G. Slater. Available at the Oxford University Press, Madras .. .. each	5	0	0
Industrial Welfare in India, by Dr. P. S. Lokanathan, M.A., D.SC.	4	0	0
Indian Agricultural Statistics, by Dr. P. J. Thomas and Mr. N. Sundararama Sastry ..	3	0	0
The Economic Results of Prohibition in the Salem District, by Dr. P. J. Thomas	1	0	0
Commodity Prices in S. India, 1918-1938, by Dr. P. J. Thomas and Mr. N. Sundararama Sastry (Bulletin)	1	0	0
Handloom Industry in South India, by Dr. K. S. Venkataraman (Bulletin)	3	0	0
Some South Indian Villages : A Resurvey, Edited by Dr. P. J. Thomas and Mr. K. C. Ramakrishnan	9	0	0
Economic Conditions in the Madras Presidency 1800–1850, by A. Sarada Raju	10	0	0

DEPARTMENT OF MALAYALAM

Kucelavrttam and Krshnavilasam, by Dr. C. Achyuta Menon, B.A., Ph.D. (London). ..	1	0	0
Subadraharanam, by Mr. V. T. Sreemanavikrama Panikkar	1	0	0

University Publications—(*continued*)

Name of Publications	*Price.* Rs. A. P.
Ballads of North Malabar, Vol. I, by Dr. C. Achyuta Menon, B.A., Ph.D. (London) ..	3 0 0
Kavyajivita Vrtti, by Mr. P. Krishnan Nair	
Vol. I	4 0 0
Vol. II	6 0 0
Attakkatha, by Mr. P. Krishnan Nair	2 8 0
Ezuttaccan and His Age—A Critical Study in English of Ezuttaccan, the Epic poet of Kerala. By Dr. C. Achyuta Menon, B.A., Ph.D. (London)	3 0 0
Kavyalokam, by Mr. P. Krishna Nair	4 0 0

DEPARTMENT OF TAMIL

Agastiya in the Tamil Land, by Mr. K. N. Sivaraja Pillai, B.A.	1 0 0
Purananutrin Palamai, by Mr. K. N. Sivaraja Pillai, B.A.	0 12 0
Chronology of the Early Tamils, by Mr. K. N. Sivaraja Pillai	5 0 0
Paranar, by Mr. V. Venkatarajulu Reddiyar	2 8 0
Kapilar, by Mr. V. Venkatarajulu Reddiar	2 0 0
Nanartha Dipikai, by S. Anavaratavinayakam Pillai ..	6 0 0
Sri Sivagra Yogin's Siva-Neri Prakasam, by S. Anavaratavinayakam Pillai	1 8 0
Purattirattu, 2nd Edition by Mr. S. Vaiyapuri Pillai	2 8 0
Kayataram, by Mr. S. Vaiyapuri Pillai	1 0 0
Dravidic Pronouns, by Mr. V. Venkatarajulu Reddiar	1 0 0
Grammatical Essays, by Mr. V. Venkatarajulu Reddiar	1 0 0
Dravidic Studies, Part I	0 2 0
Do. Part II	0 8 0
Do. Part III	0 12 0
Do. Part IV	0 12 0
Tamil Literature under the later Cholas, by Srimati T. N. Thanu Ammal	0 8 0

University Publications—(*continued*)

Name of Publications	*Price.* Rs.	A.	P.
Tamil Kavyas, their nature and history, by Mr. K. V. Jagannathan	1	0	0
Sangattamilum, Pirkalattamilum, by Dr. V. Swaminatha Ayyar..	1	0	0
DEPARTMENT OF TELUGU			
Vishnu Puranam, Ed. by Mr. K. Ramakrishniah			
Ordinary bound	1	8	0
Calico ,, ...	2	8	0
Prabhavati Pradyumnam—its sources, by Mr. P. Lakshmikantam	0	8	0
Vishnumayanatakam, Ed. by Mr. K. Ramakrishnayya	2	8	0
Studies in Dravidian Philology, by Mr. K. Ramakrishnayya	2	0	0
Sandhi (A historical treatment of the Principles of Euphonic Combination in Telugu), by Mr. K. Ramakrishnayya, M.A.	1	8	0
A Critique on Nannichodadeva's Kumarasambhava, by Mr. S. Lakshmipati Sastri (Bulletin).	2	0	0
Navanadhacharita, of Gaurana, Ed. by Mr. K. Ramakrishnayya ..	3	0	0
Vallabhabhyudayam of Kodandarama Kavi, Ed. by Mr. K. Ramakrishnaiya and Mr. S. L. Sastry ..	1	8	0
Telugu Literature outside the Telugu Country, by Mr. K. Ramakrishnaiya (Bulletin)	0	8	0
Paratatvarasayanam of Phanibhatta, Ed. by Mr. K. Ramakrishnaiya and Mr. S. L. Sastry ..	1	8	0
DEPARTMENT OF KANNADA			
Rasaratnakara by Salva, Ed. by Mr. A. Venkata Rao and Mr. H. Sesha Ayyangar	2	4	0
Abbidhana Vastu Kosha, Ed. by Mr. A. Venkata Rao and Mr. H. Sesha Ayyangar	3	8	0
Pushpadanta Puranam, Ed. by Mr. A. Venkata Rao and Mr. H. Sesha Ayyangar	4	0	0

University Publications—(*continued*)

Name of Publications	*Price.* Rs.	A.	P.
Kavirajamarga, Ed. by Mr. A. Venkata Rao and Mr. H. Sesha Ayyangar	1	8	0
Sabdamanidarpana (with the commentary of Linga-naradhya), Ed. by Mr. A. Venkata Rao, B.A., L.T., and Mr. H. Sesha Ayyangar	2	8	0
Osadhi Kosam, Ed. by Mr. A. Venkata Rao, B.A., L.T., and Mr. H. Sesha Ayyangar	2	0	0
Abhidhanaratnamala (with Nagavarma's Kannada commentary), Ed. by Mr. A. Venkata Rao, B.A., L.T., and Mr. H. Sesha Ayyangar	2	0	0
Neminathapuranam of Karnaparya, Ed. by H. Sesha Ayyangar	5	0	0
Khagendramanidarpana, Ed. by Mr. A. Venkata Rao, B.A., L.T., and Mr. H. Sesha Ayyangar	5	0	0

DEPARTMENT OF INDIAN MUSIC

The Ragas of Karnatic Music, by Mr. N. S. Ramachandran .. .. .. Available at the Indian Music Publishing House, G. T., Madras	3	0	0

DEPARTMENT OF ARABIC, PERSIAN AND URDU

The Biographical Sketches of the Muslim Poets of Southern India, by Muhammad Munawwar Gawhar Sahib Bahadur (Bulletin No. 1)	2	0	0
Sources of the History of the Nawwabs of the Carnatic,—Part I by Dr. S. Muhammad Husayn Nainar	5	0	0
Sources of the History of the Nawwabs of the Carnatic,—Part II by Dr. S. Muhammad Husayn Nainar	5	0	0
Sources of the History of the Nawwabs of the Carnatic,—Part III by Dr. S. Muhammad Husayn Nainar	3	0	0
Seydakkadi Nondi Natakam, by Dr. S. Muhammad Husayn Nainar (Bulletin No. 3)	0	12	0

University Publications—(*continued*)

Name of Publications	*Price.* Rs. A. P.
Hindi, High Hindi, Urdu, Dakhni Hindustani, by Dr. S. Muhammad Husayn Nainar (Bulletin No. 4)	0 12 0
Diwan-I-Azfari, by Mr. Muhammad Husayn Mahvi	1 8 0
Waqiat-I-Azfari, by Mr. Muhammad Husayn Mahvi	2 8 0
Diwan-I-Bedar, by Mr. Muhammad Husayn Mahvi (Bulletin No. 2) ..	2 8 0
Arab Geographers' Knowledge of Southern India, by Mr. Muhammad Husayn Nainar	6 4 0
Tuhfat-Al-Mujahidin—English Version, by Dr. S. Muhammad Husayn Nainar (Bulletin No. 5) ..	1 0 0

MISCELLANEOUS PUBLICATIONS

History of Sri Vaishnavas, by Mr. R. Gopinatha Rao	0 10 0
Psychological Tests of Mental Abilities, by Dr. A. S. Woodburne	2 8 0
A Study of the Optical Properties of Potassium Vapour, by Dr. A. L. Narayan	1 12 0
Absorption Spectra and their Bearing on the Structure of Atoms and Molecules, by Dr. A. L. Narayan	0 8 0
Investigations on the molecular scattering of light, by Dr. K. R. Ramanathan	1 12 0
The Kaveri, the Maukhari and the Sangam Age, by Mr. T. G. Aravamudan	2 4 0
Stone Age in India, by Mr. P. T. Srinivasa Aiyangar, M.A.	1 0 0
Anatomical and Taxonomic Studies of some Indian fresh and Amphibious Gastropods, by Mr. H. Srinivasa Rao, M.A., D.Sc.	1 4 0
India through the Ages, by Dr. Jadunath Sirkar, KT., M.A., Ph.D.	1 8 0
Political Theory of the Govt. of India, by Mr. M. Ruthnaswami, M.A., C.I.E.	1 0 0
Ante-natal, Natal, Neo-natal, mortality of infants, by Dr. A. Lakshmanaswami Mudaliar, M.D., L.R.C.P. ..	2 0 0

University Publications—(*continued*)

Name of Publications	*Price.* Rs. A. P.
Critical Survey of the Malayalam Language and Literature, by Mr. A. Krishna Pisharoti	0 8 0
Records of the Indian Museum, Vol. XXXI, Part I, by Mr. K. S. Padmanabha Ayyar	1 0 0
Restricted Relativity, by the Rev. D. Ferroli, S.J., D.SC.	4 0 0
Rasa and Dhvani, by Dr. A. Sankaran, M.A., Ph.D.	1 12 0
Essay on the Origin of South Indian Temple, by Dr. N. Venkataramanayya	1 8 0
Indian Currency System, 1835-1926, by Sir J. C. Coyajee	5 0 0
Political Theory of Imperialism, by Prof. K. Zachariah	0 8 0
Problems of World Economy, by Prof. V. G. Kale	2 0 0
New Light on Fundamental Problems, by Dr. T. V. Seshagiri Rao Naidu	3 0 0
Civilization as a Co-operative Adventure, (Principal Miller Lectures of 1931) by Prof. A. R. Wadia. (Reprinted from the *Journal of the Madras University*) ..	0 8 0
The Anatomy and Mechanism of the Tongue of Rana Lexadactyla, by Mr. C. P. Gnanamuthu (Thesis for the Maharaja of Travancore Curzon Price, 1931)	1 0 0
An Indian Federation, by Diwan Bahadur A. Ramaswami Mudaliar, M. L. A. (Reprinted from the *Journal of the Madras University*) ..	0 12 0
The Challenge of the Temporal Process, Principal Miller Lectures for 1933—by Dr. A. G. Hogg ..	0 8 0
Purpose and Progress, Principal Miller Lectures for 1934—by the Rev. John Mackenzie	0 8 0
Considerations on some Aspects of Ancient Indian Polity, Sir Subrahmanya Ayyar Lectures, 1914—by Rao Bahadur K. V. Rangaswami Ayyangar (Second Ed.) ..	2 0 0

University Publications—(*continued*)

Name of Publications	*Price.* Rs. a. p.
Inter-Statal Law, The Law affecting the Relations of the Indian States with the British Crown—by Sirdar K. M. Panikkar (Sundaram Ayyar—Krishnaswami Ayyar Lectures for 1933-34)	1 0 0
Problems in Filariasis. (Maharaja of Travancore Curzon Lectures, 1934-35), by Dr. T. Bhaskara Menon, M.D.	1 0 0
Some Trends of Modern Public Finance with Special Reference to India. (Sir William Meyer Lecture, 1934), by Rao Bahadur K. V. Rangaswami Ayyangar ..	2 8 0
Studies in Tamil Literature and History, by V. R. Ramachandra Dikshitar	5 0 0
The Marriage Customs and Songs of the Syrian Christians of Malabar, by Dr. P. J. Thomas (reprinted from the Indian Languages Number of the University Journal April 1936) ..	0 8 0
Humanism and Indian Thought, by Mr. A. Chakravarti (Principal Miller Lectures 1935) ..	0 8 0
Indian Political Theories, by Sir C. P. Ramaswami Ayyar. (Rt. Hon'ble V. S. Srinivasa Sastri Lectures 1936-37).	0 8 0
Opthalmology in its Relation to Clinical Medicine, by Rao Bahadur Dr. K. Koman Nayar (Maharaja of Travancore Curzon Prize Lectures, Medicine, 1936-37).	0 8 0
A Critique of Nicolai Hartmann's Ethics, by Mr. P. V. S. Narayana, M.A., B.L.	1 8 0
Individual and Social Progress, by Mr. Hari Das Bhattacharyya	0 8 0
Pre-Historic Civilization of the Indus Valley, by Mr. K. N. Dikshit	2 0 0

University Publications—(*continued*)

Name of Publications	Price. Rs.	A.	P.
Some Aspects of Ancient Indian Culture, by Dr. D. R. Bhandarkar	2	0	0
Tamil Lexicon :			
Vol. I—Part I	4	0	0
,, ,, II	4	0	0
,, ,, III	2	0	0
Vol. II—Part I	2	0	0
,, ,, II	2	0	0
,, ,, III	2	0	0
,, ,, IV and Vol. III—Part I	2	0	0
Vol. III—Part II	2	0	0
,, ,, III	2	0	0
,, ,, IV	2	0	0
,, ,, V	2	0	0
Vol. IV—Part I	2	0	0
,, ,, II	2	0	0
,, ,, III	2	0	0
,, ,, IV	2	0	0
Vol. V—Part I	2	0	0
,, ,, II	2	0	0
,, ,, III	2	0	0
,, ,, IV	2	0	0
Vol. VI—Part I	2	0	0
,, ,, II	2	0	0
,, ,, III	2	0	0
,, ,, IV	2	0	0
,, ,, V	2	0	0
Tamil Lexicon Supplement, Part I	2	0	0
,, ,, ,, II	2	0	0
,, ,, ,, III	1	4	0

Note :—200 complete sets are offered at half the published price.

3A

University Publications—(*continued*)

Latest additions

Name of Publications	*Price.* Rs.	A.	P.
Kausitaka Grhya Sutra, by Dr. T. R. Chintamani	4	8	0
Kali-worship in Kerla, by Dr. C. Achyuta Menon	5	0	0
Sri Puranam, by Mr. V. Venkatarajalu Reddiar	9	0	0
Tirikatukam and Sirupancamulam, by Rao Sahib S. Vaiyapuri Pillai	3	4	0
Tolkappiyam Eluttadhikara Aaraicci, by Mr. V. Venkatarajalu Reddiar	2	8	0
Dravidian Cognates, by Mr. K. Ramakrishnaiyya	5	8	0
Sources of the History of the Nawwabs of the Carnatic—Part IV, by Dr. S. Muhammad Husayn Nainar	4	0	0
The Individual in Progress, by Prof. P. Narasimham (Principal Miller Lectures 1939-40)	0	8	0
Diploe Moments in Chemistry, by Dr. A. Govinda Rao	0	8	0
Ahimsa and Asanga, by Sir P. S. Sivaswamy Ayyar (Basant Memorial Lectures)	0	8	0
Rudra Siva, by Dr. N. Venkataramanayya (Sir Subramanya Ayyar Lectures, 1939-40)	5	0	0
Quest after Perfection, by Mr. M. Hiriyanna (Principal Miller Lectures) ..	0	8	0
The New Constitution and After, by Sir Shaafat Ahmad Khan (Rt. Hon. V. S. Sastri Lectures, 1941-42)	3	0	0
Kambuja-Desa, by Dr. R. C. Majumdar (Sir William Meyer Lectures, 1942-43)	4	0	0
Reorganising of Education in the Madras Presidency—Report of the Special Committee appointed, by the Syndicate to examine problems of Post-War Educational Reconstruction	0	12	0

93184

PRINTED AT THE DIOCESAN PRESS, MADRAS—1948. C5574